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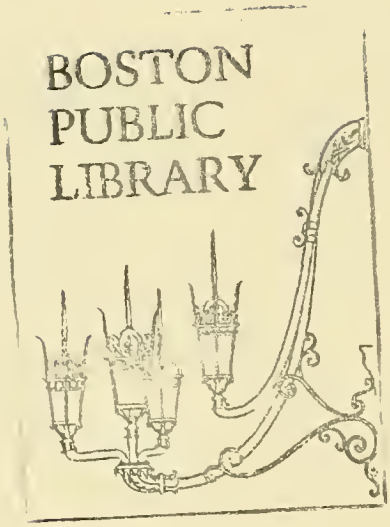
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TAX REFORM, TAX INCENTIVES AND INVESTMENT RETURNS ON RENTAL HOUSING

by

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for

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March, 1977

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Responsibility for the analysis and conclusions presented here is taken solely by the author.

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I. INTRODUCTION

The purpose of this paper is twofold: first, to analyze the effect of the Tax Reform Act of 1976 (hereafter referred to as TRA) on investment returns on rental housing and second, to consider the effect of various other modes of tax reform that might effect returns on rental residential real estate in the future. Primary emphasis is given to the effects of these tax consideration on rents, investment holding periods and yields earned on real estate investments. Additional consideration is given to related issues involving the rental housing market such as equity in the tax treatment of homeowners and renters, the effect of depreciation methods presently allowable for tax purposes on the economic life of structures and potential windfall gains and deadweight tax losses affecting some investors in real estate.

The procedure followed in the report is first to identify changes brought about in TRA directly affecting real estate investors and to briefly indicate those areas in TRA that will affect both real estate and other investors. This description as contained in Sections II and III of the report. After the material changes affecting real estate are identified, a base investment case is developed for analyzing changes in TRA and other potential tax reforms. Although the investment data are based on construction costs, rents, expenses and financing data drawn from a 120-unit garden apartment project in the midwest, data on the proportions of land, construction costs and other variables, used in this project correspond closely to a recent, more broadly based, HUD commissioned study on tax incentives and investments in multi-family apartments (3). Hence the results presented here are thought to be indicative of many real estate investments in multi-family projects.

With the data used in the base base identified in Section III, estimates of rent increases, holding period and yield changes resulting from TRA are made by using an investment model described in Section IV. The model tested for sensitivity to basic assumptions and a judgment is made as to the most likely outcome concerning rent increases due to TRA. After the analysis of TRA is concluded and after general observations are made concerning ancilliary market effects due to TRA, alternative tax reforms are considered in Section V. These alternatives include limitation of artificial accounting losses, full recapture of excess depreciation and the restriction of allowable depreciation methods to straight line or reverse sum of the years digits depreciation for periods of either 40 or 75 years. These alternatives are considered individually and then each is coupled with full recapture of depreciation and the combined impact on the base investment case is assessed. Focus is again directed on estimating potential rent increases and changes in investment yields and holding periods. In Section VI, attention is given to additional effects on the rental housing market as well as some potential advantages and problems for renters and homeowners likely to be encountered with future tax reform.[1] The paper ends with a summary and conclusions in Section VII.

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[1] An additional paper prepared by Diamond and Tolley (8) on related tax issues affecting rental housing provides an ample review of the pertinent literature in addition to an in-depth analysis of the relative costs of owning and renting. Their paper should be referred to if the reader is to obtain maximum benefit from this study.

II. MAJOR TRA PROVISIONS DIRECTLY AFFECTING RESIDENTIAL RENTAL REAL ESTATE

Many changes in TRA affect real estate investors directly while some provisions affect real estate and other investment alternatives as well. Based on a review of contents in the Act, three provisions affect real estate investors directly. These provisions deal with the treatment of: (1) construction period interest and property taxes, (2) the recapture of depreciation credit and (3) rehabilitation of low income housing under Section 167K of the IRS Code. An explanation of these items, contrasting tax treatment before and after TRA is contained in this section. One additional provision contained in the Act is also discussed here. That additional provision deals with prepaid interest and/or discount points paid in connection with borrowing for investment purposes. Although this provision is not specifically limited to real estate investors, it has a direct effect on these investors. This is because most real estate transactions involve mortgage financing, where prepaid interest and discount points charged on loans are very common. This latter provision is considered very important to real estate investors and affects real estate investment more so than other forms of investment where the practice of charging prepaid interest on discount points is not as prevalent.

A. Construction Period Interest and Property Taxes

Prior to passage of the TRA, both construction period interest and property taxes were deductible during the construction period by investors in residential rental real estate. Beginning in 1978, a phase-in schedule (see below) will become the basis for amortizing both costs for unsubsidized rental property. The same phase-in schedule will be used for subsidized housing beginning in 1982.

Essentially the phase-in schedule for writing off these costs provides that beginning in 1978 a taxpayer may deduct 25 percent of construction period interest and taxes incurred in 1978, with the remainder being deferred until the property

is ready for service or sale. At that point the remaining 75 percent of costs deferred from 1978 can be written off at the rate of one-third per year for the next three years. If additional interest and property taxes are incurred during construction in 1979, 20 percent of these charges may be deducted with the remainder being deferred until the property is ready for service or sale. The deferred portion may then be written off equally over four years. Beginning in 1980, the portion of construction period interest and property tax that may be written off declines to 16-2/3 percent with 83-1/3 percent deferred and written off over 5 years when the building is ready for service or sale. This progression continues until by the beginning of 1984, one-tenth of all construction period interest and property taxes occurring in that year will be deductible with nine-tenths deferred and amortized over a nine year period. Ultimately the intent of Act is to provide for a uniform 10 year write-off period of these costs for residential rental property, regardless of the year of construction. In any of the above cases, should the property be sold before construction interest and property taxes are completely amortized, the adjusted basis of the property would reflect any unamortized balance in the computation of taxes payable on the sale of the asset.

Phase-in Schedule for Amortization of Construction Period Interest and Property Taxes

If the amount of construction period interest and taxes is paid or accrued in a taxable year beginning in -			The percentage of such amount allow for deduction in each amortization is the following percent of such am
nonresidential real property	residential real property	low income housing	
1976			special rule permits deduction of 5 percent in 1976 and amortization of remaining 50 percent over three yea
	1978	1982	25%
1977	1979	1983	20
1978	1980	1984	16-2/3
1979	1981	1985	14-2/7
1980	1982	1986	12-1/3
1981	1983	1987	11-1/8
After 1981	After 1983	After 1987	10

B. Discount Points and Prepaid Interest

Prior to the passage of the TRA, taxpayers were generally allowed to claim deductions for interest paid in a given year. The deductibility of discount points on mortgages and loan origination fees have always presented problems due to questions concerning whether or not such charges are truly interest or service charges. These charges were usually categorized as interest if the taxpayer could show that the lender made specific, separate charges for any services rendered. If points or fees were paid from loan proceeds, even though they were categorized as interest, they were usually required to be amortized ratably over the loan period. If such charges were paid in cash, they were usually treated as interest and deducted in the year paid. If such charges were not categorized as interest, they were usually capitalized and written off over the life of the asset. With respect to prepaid interest, taxpayers on a cash accounting basis were generally allowed deductions for interest paid during the year. However, if such amounts were deemed by IRS to materially distort income (distortion of income, as defined by IRS, usually occurred when it believed a taxpayer was deducting interest for a period in excess of 12 months beyond the taxable year) such amounts were recomputed to reflect income and taxed accordingly.

With passage of the TRA, discount points, prepaid interest and like fees are deductible over the life of the loan for which such costs are incurred. This provision is effective on residential rental property in cases where prepayment occurred after September 16, 1975 except when fees were prepaid during 1976, but pursuant to a contract that exited on or before September 16, 1975. As with construction interest and property taxes, should any amounts remain unamortized when a property is sold, such amounts would be reflected in the adjusted basis of the asset when computing taxes on the sale of the asset.

C. Capital Gains and Recapture of Depreciation Credit

Prior to the passage of the TRA, capital gains treatment applied to a property held for at least six months. Recapture rules provided that for a property held less than 100 months, the difference between all depreciation taken and depreciation taken on a stright line basis had to be treated as ordinary income in the year of sale. For each month in excess of 100 months a property was held, a 1 percent reduction in the amount of ordinary income under recapture rules was allowed, such amounts thereby being taxed at capital gain tax rates.

Based on TRA provisions, a property must be held for at least 9 months beginning in 1977 and 1 year beginning in 1978 to qualify for capital gains treatment. Recapture provisions now eliminate the 1 percent monthly reduction in ordinary income for properties held longer than 100 months. All amounts of depreciation taken in excess of straight line charges will be treated as ordinary income. The new recapture provisions apply to all depreciation claimed on unsubsidized properties after December 31, 1975. Investors in subsidized properties who formerly enjoyed a 1 percent monthly reduction of amounts of depreciation recaptured as ordinary income in the year of sale after holding a property at least 20 months, are now treated in the same manner as investors in unsubsidized properties were prior to the passage of the TRA. This means that subsidized properties[1] must now be held for at least 100 months before investors are eligible for the 1 percent monthly reduction.

D. Section 167 (K)

One additional depreciation provision that expired on December 31, 1975 provided a tax subsidy for the rehabilitation of properties whose tenants are

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[1] Eligibility for tenants in FHA Sections 236, 221 (d)(3) programs and programs under Section 8 of the Community Development Act are used as general criteria in these cases.

defined as low income households, as specified by HUD regulations. Prior to the passage of TRA, a taxpayer was allowed to write-off over a five year period a maximum of $15,000 spent on rehabilitation over a minimum period of two years. Such write-offs were available as long as a property had an economic life of five years and at least $3,000 was expended over a two year period on rehabilitation.

With passage ot the TRA, expenditure limits were increased to a maximum of $20,000 and the Act extended the expiration of Section 167 (K) until January 1, 1978. Income eligibility requirements have been set in accordance with Section 8 requirements.[1] All requirements with respect to minimum expenditures and expenditure time requirements that existed prior to TRA remain the same under TRA provisions.

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[1] Roughly 80 percent of the median income of households in a given area.

III. PROVISIONS IN TRA AFFECTING RESIDENTIAL RENTAL REAL ESTATE AND OTHER INVESTMENTS

There are additional provisions in TRA that will affect investors in many areas of investment activity including real estate. Changes in the minimum and maximum tax computation, items of tax preference and changes in limited partnership provisions will have some impact on the effective tax rate of some investors depending on their income and investment portfolios. It should be pointed out that these provisions will affect many areas of investment, including both tax-sheltered and non-tax-sheltered varieties. Hence, the relative impact on real estate investment compared to other investment alternatives is difficult to assess.

A. Minimum Tax Provisions

Prior to TRA, accelerated depreciation and the unused half of capital gains (from the capital gain computation) were items of tax preference subject to a minimum tax of 10 percent less a $30,000 exemption and the taxpayer's regular income tax. Any amounts of regular tax unused as a reduction in a given taxable year could be carried forward for seven years. Passage of TRA increased the minimum tax rate to 15 percent and added three new tax preference items. Further, in computing the tax the investor may only reduce preference income by $10,000, or one-half regular income taxes paid whichever is greater, and no carry over of any unused reductions from regular income tax payment in prior years is allowed. This change applies to individual investors beginning in 1976.

D. Partnership Provisions

1. Guaranteed Payments

Prior to passage of the TRA under Section 707 of the Code, partnerships generally deducted guaranteed payments to partners for services or use of capital as an expense of the partnership. This practice was generally followed whether or not such payments were actually ordinary expenses or whether payments were actually capital expenditures of the partnership. TRA makes is clear that guaranteed payments to partners are deductible only if they are ordinary and necessary business expenses. Any other amounts must be capitalized.

2. Special Allocations

Additional provisions in the TRA that affect partnerships have to do with special allocations of items of income, gain, loss, deduction and credit under Section 704 of the Code and possibly retroactive allocations. Formerly, allocations of income and loss among partners was determined in accordance with what the partnership agreement specified. Any special allocation of profit, gain, loss, deduction or credit (or items thereof) was allowable if such a special allocation had a "business purpose" and "substantial economic effect". A common item specially allocated was depreciation, which would be allocated to partners with higher tax brackets than other partners in a given partnership. The outcome of such a special allocation was to minimize the overall amount of tax paid by the high tax bracket partners who would concede a higher cash distribution to lower tax bracket partners. Such practices were used to some extent in the industry until questioned in recent years by the IRS. The basis of challenge by the IRS had to do with special allocations of individual items determining profit and loss (eg. depreciation). Tax court rulings favoring the IRS generally reduced this practice.

TRA now provides that if there is no provision in the partnership governing ratios for sharing profit and loss (or individual items thereof) and if any

special allocations do not have substantial economic effect, then all items of income, gain, loss, deduction or credit must be allocated to each partner in accordance with each partner's interest in the partnership.

3. Retroactive Allocations

Another, perhaps more minor provision affecting partnerships in rental residential property has to do with retroactive allocations. Under Section 704 of the Code some latitude for retroactive allocations of individual items of income, gain, loss, deduction or credit was allowed. This practice was evidently followed when partners entering real estate partnerships at the end of a year received an allocation of items as though they were partners for a full year. Provisions in the TRA specify that allocations are to be made to partners based on the portion of a year in which they are members of a partnership.

4. Organization Fees

These fees, including expenditures associated with issuing and marketing partnership interests such as commissions, professional fees (eg. attorneys, accountants), and printing costs, must now be capitalized. Expenses associated with organizing a partnership must now be capitalized and can be amortized by investors for a period of not less than 60 months after December 31, 1975. Prior to TRA, practices relating to organization fees varied with some investors capitalizing them and some investors deducting them in the year the partnership was formed. This inconsistency is now eliminated with clarification concerning capitalization and amortization requirements.

IV. THE EFFECT OF TRA ON INVESTMENT IN RENTAL RESIDENTIAL REAL ESTATE

This section of the report contains an analysis of provisions in TRA most directly affecting returns on real estate investment. At the outset it must be clearly pointed out that there have been few large scale empirical studies dealing with historical returns on investment in residential rental real estate. Of the few studies which have been completed, they suffer from many deficiencies in data collection or they lack the proper methodology for measuring return on investment.[1] Such a study is very much needed at this time as it would provide basic economic data for studies such as this one, thereby eliminating or at least corroborating, various assumptions about investment characteristics necessary for the analysis. Additional supporting evidence based on a large sample of rental properties and their investment returns over time, would strengthen the reliability of estimates made in this study and allow generalizations concerning the rental housing market to be made with more accuracy.[2]

In the absence of accurate, empirical work on rental residential real estate investment returns, the procedure used in this analysis is to provide data on what is considered to be a representative case of a real estate investment in a new residential rental property. Based on assumptions regarding construction costs, rents, operating expenses, method of financing, depreciation, anticipated appreciation in the value of the property and tax rates, an expected after-tax rate of return on equity investment is estimated by assuming tax treatment in effect prior to passage of TRA. Changes in TRA directly affecting real estate investment are then imposed on the same base investment case and the expected reduction in return on investment is computed. Based on the after-tax yield that prevailed prior to TRA, corresponding increases in rent necessary to offset

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[1] See Wendt and Wong (10) for example.

[2] Such a study would also be helpful in establishing policy for subsidized housing programs.

lower investment returns due to TRA are esimated. Separate estimates are made for each major change in TRA directly affecting real estate individually, then collectively to provide some idea of the relative impact of each tax provision. Results which are estimated using this procedure are then tested for sensitivity to various assumptions made in the base investment case, thereby providing a range of possible outcomes.

A. Base Investment Case Assumptions

1. Construction Period Costs

Table 1 contains cost and financial data considered typical for a 120 unit low-rise garden apartment complex under construction in the midwestern United States during 1976. This project is located in a suburban area near a major SMSA with immediate access to freeways and major shopping facilities. Although construction costs and land values may vary geographically for projects such as this, the data provided in Table 1 are generally consistent with national survey data reported in a HUD study of multi-family housing investment.[1] Hence, although data used in the base investment case are drawn from a particular geographic location, the relative proportions of input costs (as shown in the Table) appear consistent with national construction experience for similar properties. Since there is no reason to expect the relative input proportions to materially vary by geographical region, some generalizations concerning investment returns and rent charges due to changes in tax treatment would seem to be reasonable for properties of this type.

2. Loan Draw Pattern

It is assumed that the development illustrated here has been undertaken by a group of investors in a partnership. For simplicity it is assumed that each partner makes an equal capital contribution and receives an equal share in all

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1 See: Study on Tax Considerations in Multi-Family Housing Investments (3)

TABLE 1
BASE INVESTMENT CASE DATA
(120 Unit Garden Apartment)

Base Case			% of Total	HUD Survey[a] % of Total	Median
Land cost		$160,000	9	8-16	11
Construction costs[b]		$1,543,000	85	81-90	87
Construction period interest	$78,660				
Construction period Property taxes	10,000				
Loan fees	30,000	118,660	6	3-6	4
Total Outlays		$1,821,660	100%	100%	100%
Additional data:					
Permanent loan[c]		1,438,600	79	73-90	84
Interest rate		9.25%			
Term		25 years			
Construction loan[c]		1,438,600			
Interest rate		9.25%			
Term		1 year			

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a Study on Tax Considerations in Multi-Family Housing Investments (3) Based on a sample of properties in Atlanta, Chicago, Houston, Los Angeles, New York and Washington, D.C. constructed during a period of five years or less from the HUD survey.

b Includes all direct construction costs, overhead, fees and an allowance for builder's profit.

c financing assumed to be based on a combined construction - permanent loan for 26 years.

items of profit and loss. Table 2 provides a summary of cash outlays made by the investors and by the lender during the construction period which is assumed to be one year. An assumption is also made that the land is acquired immediately prior to the loan closing for $160,000 and that subsequent construction cost draws and outlays occur at the end of each quarter. When the total loan commitment of $1,438,600 is exhausted during the third quarter, investors provide additional equity to cover outlays for the project.

It should be noted that project cost in this case includes all outlays for land, hard and soft costs, construction interest, property taxes during construction and loan fees. Construction interest is assessed monthly on each loan draw which is assumed to occur evenly over the three months in each quarter. Loan fees (discount points) of $30,000, or approximately 2 percent of the amount of the loan, are assumed to be drawn from the loan commitment. Property taxes are based on one percent of market value. Hence one percent of the land value or $1,600 is assumed to be due at closing, based on the fact that the property was acquired in the year prior to construction, and $8,400, or approximately one percent of one-half of capitalized costs (hard, soft, and land costs), is assumed to be assessed halfway during construction and due in the last quarter of the construction period.[1] Total indirect construction expenses, or construction period interest, property taxes and loan fees are $118,600, or about 6 percent of total outlays during construction. This appears reasonably consistent with HUD survey results reported in Table 1. The cash equity requirement from investors of $383,060 is determined by requirements for all outlays of $1,821,660 less the loan commitment of $1,438,600. Hence the equity requirements are approximately 21 percent and the mortgage loan 79 percent of total cost, respectively. These proportions are similar to ranges considered typical on a national basis as seen in Table 1.

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[1] The effective property tax rate of one percent is unique to the county in which the subject property is located. Assuming that these taxes are passed on to

TABLE 2
LOAN DRAW PATTERN
(BASE INVESTMENT CASE)

Quarter		(1)	(2)	(3)	(4)	Totals
Land	$160,000					160,000
Property tax	1,600				8,400	10,000
Loan fees	30,000					30,000
Interest	-	730	15,020	29,640	33,270	78,660
Construction	-	617,200	617,200	154,300	154,300	1,543,000
Owners Equity	160,000	-	-	27,090	195,970	383,060
Borrowed Funds	31,600	617,930	632,220	156,850	-	1,438,600
Total						$1,821,660

3. Operating Data

Many assumptions and estimates are made concerning the operating results which provide partial input for the investment returns that must be estimated prior to assessing the impact of TRA. These assumptions are listed below and are briefly outlined in Table 3. Expected operating results are detailed in Table 4.

(a) Market rents, determined by market survey of comparable properties at the time of construction, are estimated to be $255,000 for the entire project assuming full occupancy. However, rents are estimated to average 80 percent of this amount during the rent-up stage, or in the first full operating year after construction is completed. After the first year of operation, full occupancy is assumed with a normal vacancy and collection allowance of seven percent.

(b) Rents are initially assumed to increase at a rate of 5 percent compounded annually during the initial years of the property's economic life. Some rate of increase in rents is necessary to reflect both investor and lender expectations concerning inflation since the base investment case utilizes current market rents, mortgage interest rates and other data which implicitly contain future price expectations. These assumptions are necessary in estimating investment yields and which are in turn used as a basis for determining rent charges later in the study.

The 5 percent increase in rents is based on studies dealing with rents and economic depreciation. Weicher and Simonson (9) report that the compound growth rate in rents, as compiled in the consumer price index, was approximately 3.7 percent during the period 1967-1973. However, this rate is computed from surveys taken from the same sample of properties overtime and reflects economic depreciation to some degree. In a recent study dealing with economic depreciation,

TABLE 3
SUMMARY OF OPERATING DATA
AND OTHER ASSUMPTIONS AFFECTING
THE BASE INVESTMENT CASE

Rents (based on market survey)	$255,000
Initial growth in rents	5%
Expense ratio	43%
Initial increases in expenses	5%
Depreciation method	Double Declining Balance
Depreciable basis of asset	$1,543,000
Estimated tax life	40 years
Permanent mortgage - 25 yrs. - 9¼%	$1,438,600
Marginal ordinary tax rate	50%
Capital gains tax rate	30%
Vacancy allowance	7%

Taubman and Rasche (7) estimate that the real economic life for apartment buildings probably ranges between 60-90 years. Assuming an average economic life of 75 years, or the mid point of the Taubman-Rasche estimate, and assuming for the moment that the economic life of properties decline in a straight line, this implies that real economic depreciation would be approximately 1.33 percent of cost per year. However, Taubman and Rasche also estimate that the probable upper bound for economic depreciation during the beginning years of a property's life probably ranges from zero to one percent. Hence, adjusting the Weicher and Simonson estimate of rent increases (3.7 percent) upward by 1.33 to reflect little or no economic depreciation in the base example during the initial years, results in the 5 percent increase in rents assumed in the operating returns.[1]

Additional insight as to the plausibility of the 5 percent increase in rents assumed during the first 10 years in the base case can be gained by examining yields on government securities prevailing at the time of construction. The effective yield on 10 year government obligations at the end of 1976 was about 7.5 percent. Some researchers in the field of monetary economics have indicated that the real rate of interest has historically prevailed roughly in the range of 3 percent.[2] The difference between the 7.5 percent bond yield and the estimated real rate of 3 percent, or 4.5 percent, provides a very rough indication of inflationary expectations of investors. This rough estimate of 4.5 percent is close to the 5 percent estimated used in the base investment case.

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[1] Actually the Taubman and Rasche estimate that economic value of an asset declines in a pattern that can be characterized by a quadratic equation of the form $a+bx^2$. This pattern implies a very slow increase in depreciation over the first two-thirds of a property's life, then a short decline in the final years. However since the age profile of buildings used in the sample for compiling the consumer price index is unknown, an adjustment for depreciation to obtain an overall rent increase was not possible. Hence the straight line depreciation assumption was used.

[2] I owe this point to Professor Douglas Diamond, who with Professor George Tolley recently completed a paper on taxation and rental housing for HUD (8).

It should be pointed out that while the 5 percent growth rate is used in the base case analysis, estimates of rent changes caused by TRA, presented later in the study, are tested for sensitivity to different patterns of anticipated inflation.

(c) The operating expense ratio, a ratio of operating expenses to effective gross income, is assumed to be 43 percent throughout the operating period shown in Table 4. While many real estate appraisers seem to use a ratio of about 35 percent, this estimate either reflects expense patterns very early in a property's life or is simply an underestimate. Ratios compiled in the investment study cited earlier (3), indicate an actual range of 37 to 54 percent, with a median ratio of 43 percent, for properties 5 years or less in age.[1] Expenses are assumed to increase at the same rate as rents hence the 43 percent ratio remains effective throughout the study.

(d) Depreciation is taken for tax purposes on the basis of two times the straight line depreciation rate over a 40 year useful life with an expected salvage value equal to demolition costs at the end of that period. This useful life is generally allowable for tax purposes for a new structure such as the one used in this study.

It should be stressed that choice of depreciation methods affects the pattern of after-tax returns on real estate investments. While no one method provides a greater total deduction over the life of a property, use of accelerated depreciation methods[2] results in a tax deferral for investors because of larger deductions taken in earlier years. Although the depreciation recapture provision requires all depreciation taken in excess of straight line depreciation to be taxed at ordinary tax rates in the year of sale, the deferral of taxes that occurs under the

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[1] Based on conversations with property management firms a ratio of 40 to 45 percent is indicated as a realistic estimate during the earlier years of a project's life, with 35 percent being appropriate for only the first year or two when warranties on appliances and furnishings are in effect.

[2] The two most desirable accelerated depreciation methods allowable on new income-producing residential properties are the double declining balance and sum of the years digits depreciation methods.

accelerated methods provides the investor with an opportunity for reinvestment of funds in an amount equivalent to the reduction in tax liability during the deferral period. This "time value of money influence" affects after-tax investment yield and therefore these yields may vary with the accelerated depreciation method chosen. In the present analysis, the depreciation method used, double declining balance, provided about the same effect on investment returns as the sum of years digits method. An investment analysis was conducted using both the double declining balance and sum of years digits methods. The holding period chosen for the investment was the year in which the highest investment yield was realized, taking into account after-tax operating returns and cash proceeds from sale as estimated on a year by year basis. The holding period which corresponded to the highest investment yield was the tenth year. The double declining balance and sum of years digits methods provided virtually the same investment yield in the 10th year. Further, because the investor's holding period was anticipated to be far less than the economic life of the project, no estimate of salvage value was made. If such an estimate was used, the double declining balance method would result in a higher investment yield than the sum of the years digits method for a relatively short holding period.

(e) The effective tax rate for all partner/investors in this particular project is assumed to be 50 percent on ordinary income and 30 percent on all capital gains. These tax rates are assumed to be equivalent to that of marginal investor in real estate projects. No direct evidence on tax rates applicable to the marginal real estate investor is available. Taubman (6) estimates that if the real estate investor is in the same bracket as the marginal investor in tax-free municipal bonds, the appropriate tax rate may be less than 50 percent and closer to 35 to 40 percent. While this point is debatable, it should be stressed that most investments in real estate ventures are of the partnership variety which

generally admit relatively few investors. This restriction generally implies a larger commitment of funds than would be required to purchase a tax-free bond selling for $1,000 or less.[1] Given that investors normally diversify their portfolios to some extent, and because of the relatively high equity outlay to acquire a real estate investment, holding all else constant, the level of wealth necessary to diversify a portfolio containing a real estate investment would be greater than that associated with a diversified portfolio containing no real estate. Therefore, on diversification grounds we would expect the marginal investor in real estate to be in a higher tax bracket than the investor in tax-free obligations. In other words, the marginal real estate investor would have a tax rate that corresponds more closely with his level of wealth, which should be higher than the investor with no real estate in his portfolio. Therefore, a 50 percent marginal tax rate and 30 percent capital gain rate were chosen initially for the base case analysis.[2] Results provided later in the report are tested for sensitivity to this assumption by considering an alternative rate of 40 percent.

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[1] During the later 1960's and early 1970's a number of real estate promoters began offering limited partnership interests in minimum denominations of $5,000. In a recent SEC report on interstate sales of these interests, the number of interstate partnership offerings has declined markedly.

[2] The 30 percent capital gains rate is used instead of one-half of the ordinary tax rate because of the liklihood that the marginal investor will have to pay higher taxes in the year of sale due to the relatively large capital gain in that year. This capital gain plus accelerated depreciation, less appropriate statutory exemptions, would very likely result in payment of some minimum tax plus tax on regular income during the sale year. This would probably increase total taxes in the year of sale relative to taxes paid based on a 50 percent rate in other years. Hence the difference is reflected in the 30 capital gains rate rather than changing the marginal rate on ordinary income in the sale year.

B. Analysis of Operating Results - Base Investment Case (Prior to TRA)

Expected results from operating the subject property given the assumed rents, expenses, construction costs, and other major variables discussed in preceeding sections of the report are summarized in Table 4. The objective of the data compiled in the table are to show the effect of combining of actual cash inflows and outflows with tax provisions allowed prior to passage of TRA.

Looking to the operating results in Table 4, it is important to note the magnitude of taxable loss (8) available to the investors in this project. This loss comes about because of the allowance for accelerated depreciation (6) which is greater than real economic depreciation. The resulting tax write-off, which is assumed to reduce taxes on other earned income at a rate of 50 percent, when coupled with the cash income actually earned on the project, (rents less all cash outlays) determines after tax cash flow (12) to the investors.

It should be noted that the reportable tax loss (8) effectively runs out after the 6th year. This is caused by the fact that operating income (5) is rising due to rent increases while both depreciation allowances and interest charges diminish each year. The combination of these factors cause the reportable tax loss to eventually change to taxable income. Hence the investors actually start paying some income taxes in about the 7th year in this case.

One comparison can be made between results shown in Table 4 and the HUD Investors Study previously cited. In that study, the median ratio of operating income (5) to total cost (defined as total cash outlays) was 9 percent, with an overall range of from 7 - 11 percent on all properties 5 years old or less. This ratio computed in the third operating year of the base investment case, or $141,020 ÷ $1,821,660 = 8.2%, is well within the survey range. Hence, the estimates made in the base investment case being considered here appear to be very comparable with actual operating results as reported by investors in many projects of similar age on a national basis.

TABLE 4
BASE INVESTMENT CASE (BEFORE TRA)
OPERATING RESULTS

	Operating years	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1)	Rents	$204,000	266,430	279,750	293,750	308,430	323,860	340,050	357,050	374,910	393,65
2)	Vacancy and collection allowance		17,430	18,300	19,220	20,180	21,190	22,250	23,360	24,530	25,75
3)	Effective gross income	204,000	249,000	261,450	274,530	288,250	302,670	317,800	333,690	350,380	367,90
4)	Expenses	87,720	107,070	112,430	118,050	123,950	130,150	136,660	143,490	150,660	158,20
5)	Net operating income	116,280	141,930	149,020	156,480	164,300	172,520	181,140	190,210	199,720	209,70
6)	Depreciation	61,720	74,060	70,360	66,840	63,500	60,330	57,310	54,440	51,720	49,14
7)	Interest	132,430	130,940	129,310	127,520	125,560	123,410	121,050	118,460	115,620	112,51
8)	Taxable income (loss)	(77,870)	(63,070)	(50,650)	(37,880)	(24,760)	(11,220)	2,780	17,310	32,380	48,05
9)	Net operating income	116,280	141,930	149,020	156,480	164,300	172,520	181,140	190,210	199,720	209,70
10)	Debt service	147,840	147,840	147,840	147,840	147,840	147,840	147,840	147,840	147,840	147,84
11)	(Taxes) or tax savings (50% of 8)	38,940	31,540	25,330	18,940	12,380	5,610	(1,390)	(8,660)	(16,190)	(24,03
12)	After-tax cash flow (ATCF)	$ 7,380	25,630	26,510	27,580	28,840	30,290	31,910	33,710	35,690	37,83

C. Analysis Base Investment Case (After Passage of TRA)

To assess the impact of the Tax Reform Act of 1976 on investment returns, the base investment case is re-examined by making appropriate modifications to reflect the major changes directly affecting real estate that are contained in the Act. The major changes examined are (1) the elimination in the recapture of depreciation credit provision, which eliminates the one percent monthly reduction in excess depreciation allowances formerly allowed for properties held over 100 months, (2) the required phase-in of the amortization of construction interest and property taxes over a 4 to 10 year period, which was formerly allowed as a write-off during the construction period and (3) the mandatory amortization of loan fees (including discount points and prepaid interest) over the term of the permanent loan, also formerly written off during the construction period.

No attempt is made to assess the impact of potential changes affecting limited partnership investments in residential real estate because there appears to be no standard practice followed in the areas of special allocations and retroactive allocations (discussed in Section III (D)), therefore no general change can be examined. Further, potential changes in the tax treatment of investors caused by changes in the minimum and maximum tax provisions and tax preference items (discussed in Section III (A)(B)(C)) are not analyzed here because these items are not limited in their effects to investments in residential rental real estate. These provisions potentially affect many types of investment and their impact on real estate alone would be difficult to ascertain. However, it should be pointed out that the general effects of these changes on real estate investment are not thought to be material and should not significantly alter estimates made in the following sections of this report.

1. After Tax Equity in the Construction Period.

To begin the analysis of the base case after TRA, it is necessary to summarize the effects of provisions directly affecting investors during the

construction period, then to compare them with tax treatment prior to TRA.

Table 5 contains a summary of the major tax considerations before and after TRA which are relevant to the construction period. It should be noted that $118,660 represents tax-related items most directly affected by TRA, that is, the sum of construction period interest, property taxes and loan fees. Prior to the passage of TRA investors were allowed to deduct these items in full during the construction period. Assuming a marginal tax rate of 50 percent, these deductions formerly reduced tax liability on other earned income by $59,330 leaving $323,730 as the net equity investment during the construction period.[1]

Under provisions in TRA, the tax-related items of $118,660 shown in Table 5, must be amortized over specific periods. Loan fees must be amortized over the period of the loan (26 years in this case), and construction period interest and property taxes must be amortized over a period ranging from 4 to 10 years, depending on the year in which these costs are incurred. Case A in Table 5 represents the four year amortization requirement under the phase-in schedule provided in TRA (see Section II (A)), while Case B represents the 10 year requirement. Hence, only the extreme cases under the phase-in schedule are illustrated in Table 5. Amortization in each category is again assumed to reduce taxes on other earned income in the construction year by 50 percent. It is clear that after-tax equity investment in the construction period increases considerably in Case A and B due to the deferral of expenses formerly allowed as deductions prior to passage of TRA.

2. Changes in After-Tax Operating Returns

Modifications in the operating results previously shown in Table 4, brought about by TRA, are shown in Table 6. These changes are necessary because the

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[1] The effect of write-off of tax related items against other income during construction is traditionally shown as a reduction of initial equity investment in real estate investment literature. This convention is followed here.

TABLE 5
COMPARISON OF AFTER TAX EQUITY INVESTMENT
BASE INVESTMENT CASE

Allowable tax deductions:

Construction period interest	$78,660
Property tax during construction	10,000
Loan fees (discount points)	30,000
Total tax-related items	$118,660

	Before TRA	TRA Case A	TRA Case B
Cash equity requirements	$383,060	$383,060	$383,060
Less: tax related items at 50% marginal tax rate	59,330		
Less: Amortization of tax related items at 50% marginal tax rate			
Construction period interest		9,835[a]	3,930[b]
Construction period property taxes		1,250[a]	500[b]
Deductible loan fees (26 years)		575	575
Total tax reduction		11,660	5,005
After tax equity investment	$323,730	$371,400	$378,055

[a] 4 year amortization of construction period interest and taxes.

[b] 10 year amortization of construction period interest and taxes.

TABLE 6
AFTER TAX CASH RETURNS FROM PROPERTY OPERATION
BEFORE AND AFTER TRA

Year	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
After Tax Cash Flow (Prior to TRA)[a]	$ 7,380	25,630	26,510	27,580	28,840	30,290	31,910	33,710	35,690	37,830
Case A:										
Amortization of construction interest and taxes (4 yrs)	22,165	22,165	22,165	-	-	-	-	-	-	-
Amortization of loan fees (26 years	1,150	1,150	1,150	1,150	1,150	1,150	1,150	1,150	1,150	1,150
Total Additional Deductions	23,315	23,315	23,315	1,150	1,150	1,150	1,150	1,150	1,150	1,150
Total Deductible at 50%	11,660	11,660	11,660	575	575	575	575	575	575	575
After Tax Cash Flow (1) + (5)	19,040	37,290	38,170	28,155	29,415	30,865	32,485	34,285	36,265	38,405
Case B:										
Amortization of construction interest and taxes (10 yrs.)	8,865	8,865	8,865	8,865	8,865	8,865	8,865	8,865	8,865	-
Amortization of loan fees (26 yrs)	1,150	1,150	1,150	1,150	1,150	1,150	1,150	1,150	1,150	1,150
Total Additional Deductions	10,015	10,015	10,015	10,015	10,015	10,015	10,015	10,015	10,015	1,150
Tax Deductible at 50%	5,005	5,005	5,005	5,005	5,005	5,005	5,005	5,005	5,005	575
After Tax Cash Flow (1) + (10)	$12,385	30,635	31,515	32,585	33,845	35,295	36,915	38,715	40,695	38,405

[a] Row 12 (Table 4)

deferred portions of construction period interest, property taxes and loan fees no longer allowed as deductions during construction and written-off over specified periods of time. Note that the difference in after-tax cash returns between Case A and those estimated prior to passage of TRA from year one through three is $11,660. This amount is equal to the reduction in tax liability during the construction period for Case A shown in Table 5. It is deducted again during the first three operating years and is comprised of the 4 year write-off of construction period interest and property taxes and loan fees. Similarly, the pattern shown for Case B from years 1 - 9 shows after-tax cash flows to be some $5,005 higher than was the case prior to TRA. This is due to the longer 10 year phase-in requirement[1] assumed in Case B. During year 10, however the difference is reduced to $575 due to the effect of amortization of loan fees only.

3. Return on Equity Computations.

This section of the report deals with estimating the after-tax return on equity. This measure of profitability is estimated by considering the tax treatment applicable to the case case investment before and after passage of TRA. These estimates serve as a basis for estimating the expected impact rents in the next section of the paper, and are vital to the analysis.

The method used for determining the after-tax return in equity invested by partners[2] in the base case investment case is illustrated in equation (1).

$$\sum_{t=1}^{k} \frac{OE_t}{(1+i)^t} = \sum_{t=1}^{k} \frac{(R_t - E_t - M_t) - (R_t - E_t - I_t - D_t)\, T_t}{(1+i)^t} \qquad (1)$$

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[1] This represents one year of construction and 9 years of operation.

[2] Recall that each partner contributed an equal amount of equity capital and that they are all in the same tax bracket. Hence, the return computed here is based on total equity invested and total operating returns as each partner is assumed to receive equal shares of profits, losses, gains, etc.

Terms in equation (1) are defined as follows:

(OE) owners equity, (R) rents, (E) operating expenses (including allowances for vacancy), (M) debt service, (D) depreciation, (I) mortgage interest, (k) economic life of the investment, (T) ordinary tax rate and (i) represents the after tax rate of return to the investor. Given data for all variables, (i) is determined in accordance with equation (1) and represents the effective after-tax yield that each partner would earn on capital invested in the base investment case.[1]

While equation (1) is the proper way to measure the investment yield over a property's economic life, most investors rarely hold a real estate investment for extensive periods of time. This is true for a number of reasons. As pointed out from trends discussed in Table 4 the tax shelter provided by accelerated depreciation, which is in excess of economic depreciation, diminishes over time making more income subject to ordinary taxes.[2] As more income becomes subject to tax, investors become aware of possible lower returns and should systematically re-invest in new real estate ventures thereby re-initiating and maintaining their tax shelter over time. Coupled with this consideration is the fact that when a property is sold, the new owner is allowed 125% of straight line depreciation on the new basis of the asset, which in turn is based on the purchase price at that time. Assuming that the nominal value of a property either remains unchanged or increases over time, as the depreciation charge allowed the present owners (based on original cost) falls below the 125% straight line charge that a new owner would be allowed based on the purchase price, there exists an additional incentive to sell the property. It also follows that as nominal values rise due to inflation,

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[1] This measure is also referred to as the internal rate of return or effective yield in the finance literature.

[2] In equation (1) the second quantity in the numerator on the right side is negative in years 1-6 due to the tax shelter as in row (8) in Table 4. This "negative tax" serves to increase returns in these years. It then becomes positive in years 7-10.

the difference between accelerated depreciation allowances based on original cost and those allowances based on 125% of straight line depreciation on higher nominal values, diminish sooner. Hence the number of years that an original investor would hold a property before selling it to an investor who can take 125% of straight line depreciation would tend to be inversely related to the rate of inflation.

An additional reason why holding periods for investors in real estate tend to be relatively short in relation to the economic life of an investment has to do with the complex interaction of inflationary expectations, mortgage interest rates and equity returns. To the extent price levels increase over time, nominal yields earned on mortgage loans and equity investment will also rise. However, to the extent that unanticipated price level changes occur and are not reflected in mortgage lending rates, yields on equity will increase considerably and may provide an incentive for an investor to sell an investment before long term lending rates adjust. Hence, differing expectations as to future price level increases between borrowers and lenders are reflected in property values over time and will have an effect on investor decisions to sell properties in an attempt to maximize equity returns.[1]

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[1] The impact of unanticipated inflation on equity returns can be roughly estimated with the following relationship:

$$\Delta i = \frac{I}{1-D/A}$$

where (I) represents an unanticipated percentage change in inflation in rents on a real asset, (D) equals the amount of debt used to finance the asset (A), and (i) represents percent return on equity. Hence given a 1% change in unanticipated inflation on a property financed with an 80% mortgage, equity returns would increase by about 5% (unadjusted for any taxes paid due to reportable income occurring sooner). This relationship also probably partially accounts for the dramatic rise in the price of single family dwellings during the past 10 years.

Some evidence on time periods that investors in real estate tend to hold properties is provided in the HUD study on tax considerations in multi-family housing investments cited earlier. Based on a sample of 134 real estate investors of various types who had sold properties within five years of the study, 89% had held those properties for 10 years or less and 84% held them for less than 7 years. While this sample was not taken at random over many real estate investors, it does indicate that some of the relationships discussed above are reasonable judgments concerning the behavior of the real estate market.

Given that maximum investment returns on real estate tend to vary over different investment holding periods as a result of tax considerations and future expectations governing price increases, the proper procedure for evaluating returns for a given investor is obtained by modifying equation (1):

$$\sum_{t=1}^{n} \frac{OE_t}{(1+i)^t} = \sum_{t=1}^{n} \frac{(R_t-E_t-M_t) - (R_t-E_t-I_t-D_t)\,T_t +}{(1+i)^t} \qquad (2)$$

$$\frac{(V_n-MB_n)-(CG_n)T_{gn}-(OG_n)T_n}{(1+i)^n}$$

where the additional terms, (V_n) represents value of the property in period (n), (MB) represents the mortgage balance, and (CG) represents capital gains taxed at the capital gains rate (T_g) and ordinary income (OG) taxed at (T) in the year of sale.

This equation can be simplified for discussion as follows:

$ATCF_t = (R_t-E_t-M_t) - (R_t-E_t-I_t-D_t)T_t$

$ATCFS_n = (V_n-MB_n)-(CG_n)T_{gn}-(OG_n)T_n$ and equation (2) becomes equation (3):

$$\sum_{t=1}^{n} \frac{OE_t}{(1+i)^t} = \sum_{t=1}^{n} \frac{ATCF_t}{(1+i)^t} + \frac{ATCFS_n}{(1+i)^n} \qquad (3)$$

Essentially, this expression recognizes that at the end of any holding period (n), where (n) is less than the economic life of the investment, the investor estimates that he can realize some value for his equity (ATCFS) should the property be sold at that time. This value, based on the selling price attainable for a given property less any outstanding mortgage and taxes, when combined with annual after tax cash flow from operations (ATCF) over the holding period, determines the after tax yield (i) on investment over n periods. Ideally, the investor should evaluate (i) after each period (1 through n) and sell the property in the year that (i) reaches a maximum.[1] Operationally, carrying out this evaluation requires an estimate of market value at the end of each period, which is in turn a reflection of investor expectations of rents, price level changes and tax provisions applicable from period n to the end of the property's economic life.

a. Estimated Increase In Property Value Over Time.

Since the holding period and value that can be realized at sale are an integral part of after-tax investor returns, various estimates of annual increases in property value applicable to the base investment case are necessary to complete the analysis. It should be pointed out that there is no data available on holding period returns for real estate investors. To compute these returns would require data on acquisition prices, operating returns and sale prices for a sample of properties over time. In the absence of such data, various assumptions regarding selling prices were made. For purposes of illustration in the base investment case, the value of the property was initially assumed to increase at the rate of 3.7 percent compounded annually. This assumption is based on the 5 percent increase in rents discussed in connection with the operating data, adjusted for expected future economic depreciation.

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[1] This procedure implicitly assumes that acceptable alternatives are available for reinvestment of ATCF proceeds in each year 1 through n at a rate of return equal to (i).

In other words, investors are assumed to assign a value to real estate at the end of each period by estimating future income adjusted for anticipated future economic depreciation.[1]

In estimating the nominal increase in property value, the real economic value of the property was assumed to equal total construction cost initially, then to decline in accordance with reverse sum of the digits (SYD) depreciation over a 75 year period (the mid-point of the 60-90 year Taubman-Rasche estimate (7)).[2] The result obtained in each year was then compounded at a rate of 5 percent to obtain a pattern representing the nominal value of the property over time. A compound interest equation of the form $(1+i)^n$ was then fitted to the nominal value pattern for a period of 50 years.[3] The compound growth rate required to obtain the nominal price change in the property from the first through 50th year

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[1] This relationship is based on the assumption that investors expecting to achieve some yield on investment recognize the simultaneous effects of inflation and economic depreciation in future periods and capitalize them in the value of property over time.

[2] Depreciation under the regular sum of the years digits method is computed by taking the sum of $N(N+1/2)$, where N equals the tax life of a property, and forming the ratio $1 \div N(N+1/2)$ X cost which equals the allowable charge in the first year. The ratio $2 \div N(N+1/2)$ would be used in year two, and so on. Reverse sum of the years digits would begin in year one with $N \div N(N+1/2)$, in the year two $N-1 \div N(N+1/2)$, and so on.

If reverse SYD, as proposed by Taubman and Rasche, is a more accurate reflection of real economic depreciation, it is interesting to note that SYD as presently allowed by the IRS Code is the exact opposite of what should be used, assuming a tax-neutral policy for real assets is desirable. The effects of such a change on real estate investors is explored later in this paper.

[3] A 50 year period was chosen because the inflection point on the nominal value curve occurred at approximately 50 years and the nominal value pattern over that range could be closely approximated with the compound interest equation. Since the investment holding period was suspected to be far less than 50 years, this method of estimating nominal values, adjusted for economic depreciation, should provide a reasonably good estimate over the period of time relevant to this analysis.

was about 3.7 percent. That compounded growth rate was used to represent the nominal increase in property value, given a 5 percent inflation rate and a real economic value declining in accordance with reverse SYD depreciation over 75 years.[1]

4. Comparison of Investment Results

Based on the assumed 3.7 percent rate of increase in property value, the after-tax cash flows detailed in Tables 4 and 6 and the equity investment requirements shown in Table 5, investment yields were computed by assuming the subject property was sold at the end of each year. Cash proceeds from the assumed sale in each period were combined with annual operating returns and a series of yields on after-tax invested equity were computed, period by period.

Estimates of the after-tax equity yield and the number of years required for this yield to reach its maximum were computed first for the base case assuming tax treatment prior to TRA. Yields were then estimated for the same investment holding period for Cases A and B. Computations made for Cases A and B were based on the same equation (3) with modifications in equity requirements (Table 5) and amortization of deferred construction interest, property taxes and loan fees (as reflected in Table 6).

Two additional changes had to be incorporated in Cases A and B to properly reflect provisions in TRA regarding the recapture of depreciation and amortization of loan fees. Since TRA eliminated the recapture credit for unsubsidized properties, that provision was eliminated in the computation of after-tax cash returns in the year of sale. Also, because loan fees were assumed to be written off over 26 years, the unamortized balance of such fees reduced taxable gains in the year of sale. A comparison of these changes is provided in Table 7.

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[1] It is obvious that at some point, when real depreciation become significant, rents would not continue to increase at 5 percent. At that point rent increases in nomina terms would fall as the real value of the property declines. However, in the analys presented here, it will be seen that the investment holding period is on the order o 10 years after construction, hence this pattern of rents and property value is con-

TABLE 7
COMPUTATION OF AFTER-TAX CASH FLOW
IN YEAR OF SALE
(assumed to be year 10)

			Prior to TRA		Case A & B
Sale price			$2,619,700		$2,619,700
Less: Selling cost (4%)			104,790		104,790
Mortgage balance			1,196,960		1,196,960
Before Tax Cash Flow			1,317,950		1,317,950
Sale price			2,619,700		2,619,700
Less: Selling cost			104,790		104,790
Depreciation basis of asset			1,093,570		1,093,570
Unamortized loan fees:			-		17,350
Total Gain			1,421,340		1,403,990
Before Tax Cash Flow			1,317,950		1,317,950
Excess Depreciation:					
Accumulated depreciation	609,420			609,420	
Less: Straight Line depreciation	378,660			378,660	
Recapture credit	46,150			-	
Ordinary Income	184,610			230,760	
Tax at 50%			92,305		115,380
Total Gain	1,421,340			1,403,990	
Less: Ordinary Income	184,610			230,760	
Capital Gain	1,236,730			1,173,230	
Tax at 30%			371,020		351,970
After tax cash flow (ATCFS):			854,630		850,600

After incorporating all changes, period by period yields were computed for all these cases and are reported in Table 8. It should be noted in Table 8 that the yield computed assuming tax treatment prior to passage of TRA reached its maximum, or 14.8 percent, 10 years after construction. Computation for Cases A and B for the same 10 year holding period provided yields of 14.0 and 13.6 percent respectively. There are many reasons for the differences in the three yields shown in Table 8. The deductions for construction period interest and property taxes, although not eliminated by TRA, are deferred over time, hence the investor loses the discounted value of these deductions which were formerly allowed in the construction year. Further, the recapture credit formerly allowed at the rate of 1 percent per month for residential properties held longer than 100 months has been eliminated, thereby increasing taxes paid in the sale year by the difference between the investor's marginal and capital gains tax rate (see Table 7). The amortization of loan fees are also deferred over time thereby resulting in a loss in terms of discounted value. Also, any of these fees remaining unamortized in the year of sale serve only to reduce capital gains taxes(see Table 7), as opposed to a deduction in the construction period which would formerly have been taken at the investor's ordinary tax rate. These effects, in combination, cause the reduction in yield from 14.8 percent in the base case prior to TRA to 14.0 in Case A, where the amortization period for construction period interest and taxes is four years, to 13.6 percent in Case B, where the amortization period for the same costs is longer (10 years).

With respect to the plausibility of the 14.8 percent yield suggested in the base investment case, it should be again reiterated that there are no historical studies of returns on real estate investment against which this result may be judged. In the HUD study on tax incentives and multi-family investments a median return of 14 percent was reported by investors as the

return earned on their last real estate investment. However, there appeared to be inconsistency in the measurement of this return with some investors not including the tax shelter or an estimate of sales proceeds over the investment holding period, and others including tax benefits and the annual reduction of mortgage debt in the measurement. As indicated previously, estimates of rent changes that are to be made in succeeding sections of this report, will be tested for sensitivity to assemptions made in the determination of the case investment yield.[1]

TABLE 8
ESTIMATED AFTER TAX YIELDS
BASE INVESTMENT CASE
(10 year holding period)

Base Case	Yield
Before TRA	14.8
TRA Case A	14.0
TRA Case B	13.6

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[1] With respect to the 14.8 percent yield, it should be again pointed out that an assumption implicitly made in its computation is that all cash inflows and outflows occurring over all periods after acquisition of the land can be reinvested at the same 14.8 percent yield. For example, during the time interval between acquisition of the land for the project until near the end of the construction period when additional equity is paid out by the investor (see Table 2), the procedure employed per equation (3) is to discount the additional amount of equity paid in during construction at 14.8 percent as though that rate of compound interest could have been earned during the construction period on funds yet to be committed. This reinvestment assuption poses a problem for investments such as this, when cash commitments occur over time. Since investors do not have to commit funds all at once in these investments, it is true that they can earn some opportunity rate on funds yet to be committed. However in this case it is unlikely that the full yield earned over 10 years is the appropriate opportunity rate, unless one assumes a completely flat yield curve. If an assumption is made that such funds are invested at a "safe" rate of interest, say, 6% before they are finally committed, the 14.8% yield computed in the base case would fall to about 14%. Yields computed in Case A and B would also be reduced accordingly.

5. Impact on Rents.

To establish the probable impact on shelter rents, assumptions regarding the economic structure of the rental housing market are necessary. This is particularly important because whether or not the tax changes affecting real estate investors will affect rents depends on whether or not reductions in after-tax yields are shifted forward to renters in the form of higher rents. Hence the question of shifting and incidence of taxes in this case depends, to a considerable extent, on the competitive nature of the housing market.

If the rental housing is reasonably competitive, the likelihood is high that investors shift tax effects forward to renters, thereby maintaining a competitive return on capital. There are a number of aspects of the rental housing market that suggest it is reasonably competitive. These attributes include: large numbers of buyers and sellers, few barriers to exit and entry by producers, a relatively free flow of information concerning rents and the services provided and competition in the factor input markets (labor, land, capital).[1]

In estimating the impact of provisions in TRA directly affecting rents, it is assumed that after-tax yields on equity capital earned by the marginal investor (in the relevant marginal tax bracket) prior to passage of TRA will be maintained in the long run, or after provisions contained in TRA become effective. In other words, it is assumed here that investors evaluate returns on capital on a strict after-tax basis and that any changes in tax treatment affecting such returns must be eventually reflected in rents. Further, if new construction is to occur over time, investors currently affected by provisions in TRA must be able to earn the same return that prevailed prior to TRA, if an increase in the supply of rental housing is to occur in the long run.

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[1] For additional discussion on this point see: Olsen (5) and Aaron (1). For a discussion of taxes, yields on capital and competitive markets see Bailey (2).

Given the assumption that returns on capital in rental housing markets are competitively determined, the approach used in estimating the long-run effects of TRA on rents was accomplished by modifying the yield formulation shown in equation (3). Recall that based on operating cash flows detailed in Table 6 and equity investment on an after-tax basis detailed in Table 5, the yield in the base investment case prior to TRA was determined to be 14.8 percent after 10 years (See Table 8). Similar computations were made for Cases A and B and yields were found to be somewhat lower because of differences in equity requirements (Table 5), operating returns (Table 6) and returns in the year of sale (Table 7). Based on the previous discussion concerning competitive markets, if the after-tax return prior to TRA is to again be earned in Cases A and B, it is clear that holding all else constant, rents (R_t) must increase in both cases. To solve for the increase in after-tax cash flows in both cases necessary to provide a 14.8 percent yield, equation (3) was modified as follows:

$$\sum_{t=1}^{n} \frac{\Delta ATCF_t^b}{(1+i)^t} = \sum_{t=1}^{n} \frac{OE_t^b}{(1+i)^t} - \sum_{t=1}^{n} \frac{ATCF_t^b}{(1+i)^t} + \frac{ATCFS_n^b}{(1+i)^n} \qquad (4)$$

This modification, shown for Case B (hence the superscript b), simply requires the substitution of after tax cash flow ($ATCF^b$) in each year for Case B from Table 6, equity investment requirements (after-tax) (OE^b) from Table 5, and after-tax cash returns from sale ($ATCFS^b$) for 10 operating periods (Table 7). When discounted by 14.8 percent per year, which represents the yield that prevailed before changes brought about by TRA, the change in after tax cash flow in each operating period ($\Delta ATCF^b$) on the left side of the equation represents the quantity necessary to bring about equality. This change ($\Delta ATCF^b$), when added to ($ATCF^b$), represents the amount necessary for the investor, under the tax treatment in Case B to realize the same 14.8 percent return on investment

that existed prior to TRA.[1] The change in rent that must come about to provide ($\Delta ATCF^b$) is then found by considering successively higher rent levels, holding all other variables constant, necessary to being about equality in equation (4).[2]

The procedure, used for estimating the long run increase in rent discussed in connection with Case B, was also used for Case A. Further, each major provision in TRA directly affecting real estate investment, namely the construction period interest and property tax provision, the amortization of loan fees and the elimination of the depreciation recapture credit was analyzed individually to determine the relative importance of each provision.[3] The results of this analysis is compiled in Table 9.

Results in Table 9, show that the single most important provision in TRA that will affect long run rents is the 10 year amortization of construction period interest and property tax requirement. This provision alone will require an increase of 2.7 percent in rents to provide the investor with the same rate of return on equity that was earned prior to passage of TRA. Amortization of loan fees followed in terms of relative impact on rents with a 1.9 percent estimated increase, and elimination of the depreciation recapture credit had the smallest individual impact of .3 percent. This last provision is relatively unimportant because of the fact that the increased tax does not occur until the year of sale and because of the influence discounting. The other two provisions, which affect tax deductions in the year of construction, have a much greater impact on rents.

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[1] It should be stressed at this point that the objective of this procedure is to determine the rent level necessary to provide at least the same 14.8 percent return on investment over the same investment holding period. Assuming that rent changes caused by TRA occur uniformily over the economic life of the investment, the actual maximum rate of return and investment holding period may well change. This possibility is taken up later in the report.

[2] This is an interative search procedure that can only be done by trial and error. The solution was found with a simulation routine via computer programing.

[3] In each case appropriate modifications were made in equation (4) for each provision holding all other variables constant. The 14.8 percent discount rate and the 10 year investment holding period were held constant throughout the analysis.

TABLE 9
ESTIMATED INCREASE IN RENTS AS
A RESULT OF TRA
(BASE INVESTMENT CASE)

TRA provision	Estimated % change in rent
4-year amortization of construction period interest and property taxes	1.2%
10-year amortization of construction period interest and property taxes	2.7
Amortization of loan fees	1.9
Elimination of depreciation recapture credit	.3
Case A (items 1, 3, 4 combined)	3.3
Case B (items 2, 3, 4 combined)	4.8

D. Sensitivity Analysis of Results to Assumptions

1. Changes in Inflation, Mortgage Financing and Tax Rates

The results in Table 9 are detailed for the base investment case, for which numerous assumptions were detailed in Section IV (A) of this report. It should be recalled that assumptions particularly important to this analysis were (1) the assumed rate of increase in rents and property value due to anticipated inflation (2) the tax bracket of the marginal investor and (3) and the amount borrowed in financing the investment. These assumptions do affect the after-tax investment yield, which is the key variable upon which many of the estimates in forthcoming sections of this report depend. Additional computations were made to discern the sensitivity of the rent changes reported in Table 9 to changes in these assumptions.

Patterns of anticipated inflation used to establish sensitivity in the base case results include a current inflation rate of 5 percent in rents and a long run inflation rates in rents of 3.5, 6 and 8 percent as exemplified in the value of the property over time.[1] These rates can be compared with the base case assumption of a 5 percent increase in rents. In the base case, the mortgage loan was assumed to be 80 percent of total cost. Borrowing patterns reported in the HUD investor study ranged from 73 to 90 percent of value. Hence, a 90 percent loan was used in re-estimating rent changes to provide some idea of the sensitivity of the base case results to the borrowing assumption. Finally, base case results and the changes in inflation and borrowing assumptions were re-estimated using a 40 percent marginal tax rate to establish the sensitivity to the effective tax rate assumption.[2]

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[1] The long run rate of inflation of 3.5, 6 and 8 percent were reduced downward by using reverse SYD depreciation to reflect economic depreciation as was done in the base investment case. Hence the actual rates used for increasing the property value were 2.2, 4.7 and 6.7 percent respectively.

[2] Capital gains were assumed to be taxed at 25 percent in these estimates.

The procedure used in all computations was to first evaluate each change individually in the base investment case by determining the maximum after-tax yield and the year in which it occurred. This was done in accordance with equation (3). Given these modified yields and investment holding periods, changes in TRA commensurate with Case B (elimination of depreciation recapture credit, amortization of loan fees and 10 year write off of construction period interest and property taxes) were made and the new level of rents required to provide the modified yields in the respective holding periods were estimated in accordance with equation (4). The increased level of rents in each case necessary to produce the required modified yield resulting from changes in base case assumptions, were expressed as a percentage of base case rents and are shown in Table 10.

Results detailed in Table 10 show that when various assumptions concerning borrowing, anticipated inflation and tax rates are changed, the after-tax yields (column 1) and holding periods (column 2) are significantly affected in some cases. For example, results in column (1) indicate that when the anticipated inflation rate is relatively low as in (c) where a 3.5 percent rate is assumed, the yield for the 50 percent taxpayer/investor would be 13.3 percent and the increase in rents necessary to provide that same yield after provisions in TRA become effective (per Case B) is estimated to be 3.1 percent. This change can be compared with successively higher inflation rates such as the 5 percent rate assumed in the base case (a), the 6 percent rate in (d) and 8 percent rate in (e). Each of these inflation rates increase yields when incorporated into the base case (column 1) and also increase the percentage increase in rents required to maintain those yields after TRA to 3.1, 5.6 and 9.8 percent respectively (column 3).

TABLE 10
SENSITIVITY OF CHANGES IN RENTS
TO CHANGES IN BASIC INVESTMENT ASSUMPTIONS

	Investor - 50% Tax Bracket	Base Case After Tax Yield	Base Case Holding Period	Estimated Change in Rent After TRA[d]
(a)	Base Investment case	14.8%	10	4.8%
(b)	90% permanent loan	18.7	10	6.2
(c)	5% rent increase, 2.2% property value increase[a]	13.3	20	3.1
(d)	5% rent increase, 4.7% property value increase[b]	16.4	9	5.6
(e)	5% rent increase, 6.7% property value increase[c]	20.3	5	9.8
	Investor - 40% Tax Bracket			
(f)	Base investment case	14.6	13	2.9
(g)	90% permanent loan	17.6	11	3.7
(h)	5% rent increase, 2.2% property value increase[a]	13.4	26	1.8
(i)	5% rent increase, 4.7% property value increase[b]	16.2	9	3.6
(j)	5% rent increase, 6.7% property value increase[c]	20.0	5	6.4

[a] inflation rate 3.5%, adjusted for depreciation

[b] inflation rate 6.0%, adjusted for depreciation

[c] inflation rate 8.0%, adjusted for depreciation

[d] assuming TRA changes exemplified in investment Case B

The same series of anticipated inflation rates, when incorporated into the base case for an investor in the 40 percent tax bracket provides a similar increasing pattern of yields and changes in rents necessary to maintain those yields. However the ranges narrow for both yields and rent increases estimated for the 40 percent taxpayer. Results computed assuming a 90 percent permanent loan also indicate substantial increases in yields and rent changes. This computation was made with the same 9.25 percent mortgage interest rate used in the base case however, and probably results in an overestimate in both the yield and the required change in rent. Results in this case are probably overestimated because one would expect the interest rate on the mortgage to increase as the amount borrowed increases, as opposed to remaining constant. Such an increase in the interest rate would reduce yields shown in Table 10 for both the 40 and 50 percent taxpayer (cases (b) and (g)) and therefore reduce the required rent changes in both cases.

E. Rent Changes and TRA - Final Estimate

Given the estimates in Table 10, a question arises concerning the set of assumptions that will provide the best estimate of rent changes likely because of TRA. In the absence of an empirical study on returns earned on investment in residential real estate, the answer is not obvious. However, based on known characteristics of real estate investment and some economic relationships, a reasonable judgment can be made. First, due to the reduction in tax shelter caused by reductions in accelerated depreciation charges over time (Table 4) one would expect the optimal investment holding period to be in the neighborhood of 10 years. This point seems to be confirmed with HUD study previously cited. The lower-bound inflation rate of 3.5 percent indicates that the highest returns in the base case investment, should that inflation rate actually occur, would be realized in about 20 years for the 50 percent taxpayer/investor (c) and 26 years for the 40 percent taxpayer/investor. These holding periods would seem to be longer than expected and differ from the general result in the HUD investor study.

With respect to the very high inflation rate of 8 percent, it should be recalled that a mortgage interest rate of 9.25 percent prevailed at the time much of the market data for this study was gathered. Implicit in this interest rate is an anticipated inflation rate over some expected loan period (before any refinancing or the sale of the property occurs) on the part of mortgage lenders. In all probability, the 8 percent upper bound rate of inflation chosen as an extreme in this study was not the inflation rate anticipated by lenders quoting 9.25 percent interest rates at the time of this study. To the extent these lenders have accurate foresight as reflected in lending rates, the upper bound inflation estimate is probably too high.

The above discussion, plus the fact that investors in the HUD study anticipated a 14 percent return on investment in 1972 (although how they computed this expected yield is somewhat unclear) with an indicated holding period of 7-10 years, seems to indicate that the mid-range inflation estimates of 5 and 6 percent in Table 10 are most plausible, at least in terms or expectations existing at the time of this study. These mid-range estimates for either the 40 or 50 percent taxpayer are represented in items (a) and (f) and estimates made for the long run inflation rate of 6 percent are represented in items (d) and (i). Based on these results, it would appear that a most likely estimate of maximum rent increases due to provisions in TRA directly affecting real estate would range between 4 and 5 percent. This estimate corresponds very closely to the initial 4.8 percent estimate made for investment Case B (see Table 9).

F. Adjustment in Rents and Rental Housing Market Adjustments

It must be stressed at this point that the rent changes estimated in the previous section were made under the assumption that changes in tax treatment were reflected in rents instantaneously. This assumption, though not made explicitly, is implicit in the methodology used in making the estimations.

In fact, the effects of these tax changes are long-run in nature. In other words, rents must eventually rise sufficiently high enough to induce a normal increase in the supply of new rental units and to provide suppliers with a competitive return on capital. The time required for such adjustmentsto actually work themselves out in the housing market is hard to determine. The time required would partially depend on the present state of the housing market, that is, whether a condition of over or under supply of rental housing presently exists. If excess supply exists, the rate of new construction will be slow, thus prices will take longer to adjust and vice-versa. Additionally, since the amount of new construction that occurs annually is but a small fraction of the existing rental housing stock, it may be quite some time before the changes reflected in new construction would be fully transmitted throughout the housing market. Further, because of these tax changes, some renters will most assuredly become homeowners in response to higher rents.[1] Consequently, more existing rental units will initially become available because of this shift, thereby increasing the time lag for full adjustment. Past research indicates that the number of years required for housing markets to substantially adjust to change in prices and other variables is on the order of six years.[2] While this search was done in the owner-occupied segment of the housing market, and it may not be total completely indicative of the time required for similar adjustments in rental housing, it does point out that full adjustment does require time and estimates made in this study should be interpreted in light of this fact.

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[1] See: Diamond and Tolley (8) for an estimate of this change.
[2] See: Muth (4) for more detail on this question.

G. Possible Changes in Tax Rates

In all estimates made thus far, the relevant tax rate for the marginal investor was assumed to remain at 50%. Given the changes in TRA which affect the tax treatment of real estate directly and provisions that potentially affect many other investments including real estate (eg: the minimum and maximum tax provisions, excess interest, etc.), the tax rate of the marginal real estate investor may change somewhat due to the combined influences of all of these TRA provisions. Analysis of all of these provisions individually and collectively would be a complex undertaking beyond the scope of this report. However, it has been shown that combined effects of TRA provisions directly affecting real estate investors initially reduces after-tax yields and results in increased rents in the long run. Since a lower proportion of the after-tax yield (post TRA) will be comprised by tax-sheltered income, more investors in lower tax brackets will now consider real estate investments. The overall impact at this point in time however, is thought not to be significant enough to influence the rent changes estimated in the preceding section of this report.[1]

H. Potential Changes in Financing Patterns.

The provision in TRA that will have the greatest impact on real estate investment appears to be the amortization of construction period interest and property taxes (Table 9). It follows that the ratio of debt to equity capital employed by investors will change somewhat due to the higher after-tax cost associated with interest on mortgage loans. We would expect equity invested to rise relative to mortgage debt as real estate investors would substitute other sources of borrowing (against their personal portfolios) for mortgage funds.

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[1] It should be pointed out that to the extent lower tax bracket investors are attracted to real estate and the tax rate of marginal investors shifts downward, the rent changes in Table 10 would be understated. This point is taken up in more detail later in the report.

This would still provide them with current as opposed to deferred tax deductions. Further, due to the increased after tax cost of debt financing, construction periods may be shortened somewhat. How much of a change in financing will occur, its timing and impact on results reported here is difficult to estimate. We do know however, that the excess investment interest provision in TRA will preclude substitution of other forms of borrowing to some degree and that the amount of additional equity available for real estate investment in lieu of borrowing will be somewhat constrained by the wealth of the marginal investor. Based on these observations, it would seem unlikely that significant changes in financing patterns will occur as a result of TRA. Consequently, these changes should have no significant impact in the analysis presented here.

I. TRA and the Base Investment Case - Additional Considerations

In addition to the estimates of long run increases in rent that are expected due to provisions in TRA, there should be other effects on real estate investors and on the housing market. These effects are explained in this section of the report.

1. Windfall Gains to Existing Property Owners.

Because most provisions in TRA affecting real estate investment will apply to investors in newly constructed rental projects, taxes paid by existing property owners will not be materially affected by the changes.[1] Consequently, the long run increases in rent necessary to bring about increases in the supply of new rental housing will also be realized by existing property owners. These increases in rent result in a one-time, windfall gain to owners of existing properties.

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[1] The main exception being the elimination of the recapture of depreciation credit on all depreciation taken after December 31, 1975. For existing property owners, this provision will affect taxes paid in the year that a property is sold to the extent it is held beyong December 31, 1975.

A rough approximation of this windfall can be made for a property comparable to the property being considered here by capitalizing the 4.8 change in rents (after tax) estimated to occur due to TRA (Case B) by the 14.8 percent yield in the base investment case. Since the increase in rents will be realized by existing property owners with no additional risk or outlay of capital, the after-tax incremental returns realized by existing property owners will be capitalized into property values. Referring back to the investment example in Table 4, we should note that taxes are paid on operating income from years 7 through 10. From years 1 through 6, an operating loss is shown and no taxes are paid. Based on this example, taxes paid on operating income would average about 20 percent over the investment holding period. Assuming the 10 year period as optimal for the investor and that the property is turned over regularly every 10 years, the change in rents would be taxed at an average of 20 percent during each period of ownership. Taking 4.8% of market rents which were estimated to be $255,000 at the time of this study, or $12,240 and reducing that amount by an average tax of 20 percent, leaves about $9,790. This amount when capitalized at 14.8 percent over a 75 year estimated economic life, results in an increase in value of about $66,000.[1] However, if investors view this "windfall" with a high degree of certainty, then the rent increase (after tax) would be capitalized with a lower capitalixation rate, and the property value would increase by a greater amount.

It should be pointed out that this estimate, like all rent estimates made in the preceeding section, is made under the assumption that there is an instantaneous increase in rents in response to changes brought about by TRA. To the extent that lags in rent changes occur because of temporary over-supply conditions

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[1] Recall that the total cost of the property used in the base case was over $1.8 million, hence this estimated windfall represents an increase in property value of about 3.7 percent.

or other causes, this windfall would more than likely be lower than the amount estimated. Further, as pointed out previously since annual incremental additions of rental housing as a percentage of the existing rental stock is so small, the time lag required before the full adjustment in rents is complete may be considerable. Hence, if the increased rents are realized further in the future, the discounted value of these changes would be less and the equivalent windfall gain lower.

2. Effect on Investors in Higher Tax Brackets.

One of the most common criticisms of tax-sheltered investments is that since the marginal investor/taxpayer determines the relative prices of investments, investors with tax rates in excess of the marginal investor's rate enjoy higher-tax-free returns. These returns are sometimes referred to as a "deadweight loss" by students of public finance.[1] The same phenomenon applies to tax shelters in real estate, and the amount of these additional returns to higher tax bracket investors will be influenced by changes in TRA. For example, in the base case an after tax yield of 14.8 percent after a holding period of 10 years was earned by an investor in a 50 percent tax bracket who was also assumed to be the marginal real estate investor. When the same investment is made by an investor in the 70 percent tax bracket[2] this yield increases to 15.5 percent. This increased return is brought about by the added value of the tax shelter to the 70 percent taxpayer. When changes in TRA are made under assumptions in Case B,[3] and the 4.8 percent increase in rent necessary to maintain the 14.8 percent return for

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1 The most commonly used example of this relationship is used in comparing equivalent before-tax yields on tax-exempt municipal bonds for the marginal investor and investors in higher tax brackets.

2 With capital gains taxed at an assumed rate of 40 percent. This is to account for items of preference income in the form of larger capital gains in the year of sale. Rather than changing the marginal tax rate on ordinary income in the year of sale, five percent was added to one-half the ordinary tax rate. This procedure has been followed uniformily throughout the report.

3 Case B, it should be recalled, includes the required amortization of loan fees over the term of the loan, elimination of the depreciation recapture credit and write-off of construction period interest and property taxes over 10 years

the 50 percent marginal investor is evaluated for the investor in the 70 percent tax bracket, the maximum rate of return falls to 14.5 percent in about the 10th year.

The sharp reduction in yield earned by the 70 percent taxpayer/investor occurs primarily because of the elimination of the depreciation recapture credit. Elimination of this credit increases the tax liability of the 70 percent taxpayer relative to the 50 percent taxpayer, who is assumed to be the marginal investor. Since increases in rents are determined by the tax status of the marginal investor, the 4.8 increase in rents in investment Case B does not compensate the 70 percent taxpayer/investor for the increase in taxes due to loss of the recapture credit. A similar relationship occurs with respect to the loss of "time value of money" associated with deferring deductions formerly allowed during construction. The incremental increase rent necessary to offset the loss of time value associated with these deductions in investment Case B is determined by 14.8 percent yield earned by the marginal investor. Since the marginal investor is assumed to be in the 50 percent tax bracket, the incremental change in rent is not enough to offset the loss in time value for the 70 percent taxpayer who had a 15.5 percent yield prior to TRA.[1] As a result of the changes in TRA directly affecting tax shelters in real estate then, the higher yield formerly enjoyed by higher tax bracket taxpayers relative to the marginal investor/taxpayer will be reduced and the "deadweight loss" neutralized somewhat.

3. Changes in Investment Holding Periods and TRA.

In previous work done on tax shelters and rental housing, concern has been expressed regarding rapid turnover of rental properties by absentee owners. Frequent turnover of properties has been alleged to result in under-maintenance and rapid deterioration.[2] As has been pointed out in the base case, the optimal

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[1] Again the analysis assumes no change in the relevant tax bracket for the marginal investor occurs after TRA.

[2] See Taubman (6).

investment holding period prior to changes brought about by TRA was approximately 10 years after completion of construction. As was discussed, investment holding periods are influenced by the declining pattern of depreciation charges allowed for tax purposes, inflation, the timing of deductions for construction interest and property taxes and other variables.

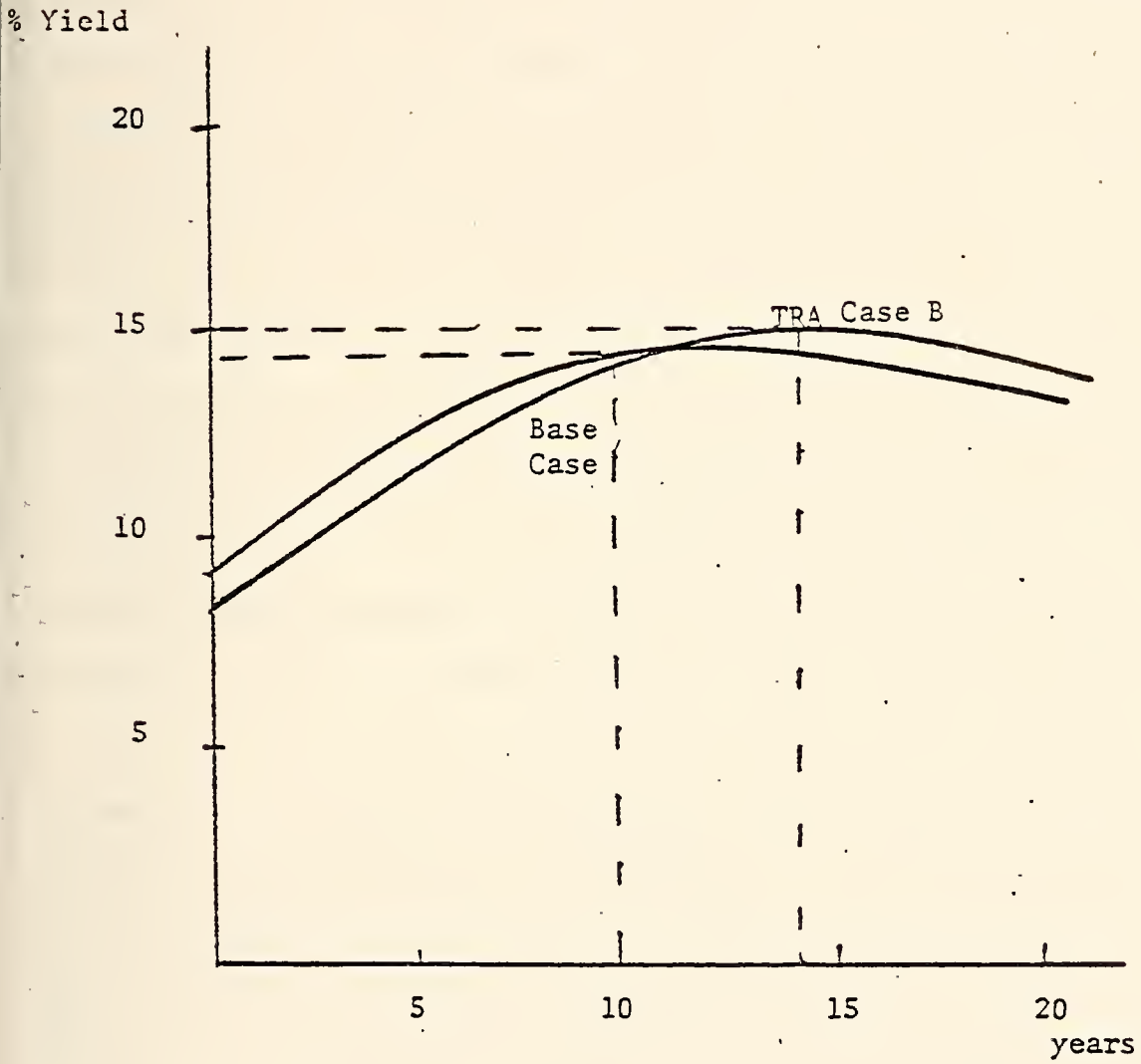
Prior to TRA, the deduction of interest, property taxes and loan fees in the construction year influenced the return on investment considerably because of the immediate reduction in taxes for investors. As estimated in previous sections of this report, deferral of these construction period charges (as in Case B) and elimination of the depreciation recapture credit should result in a long run increase in rents. However, another effect of deferring these charges and elimination of the recapture credit (as in investment Case B) will be to lengthen, somewhat, the optimal holding period for real estate investments. The reason for this is because deferring charges that were formerly deductible in the construction year reduces the incentive to sell a property until full amortization occurs. Further, the elimination of the recapture credit increases taxes in the year of sale thereby reducing the incentive to sell.

In previous sections of the report, estimates of rent changes brought about by TRA were made under the assumption that at least the same after-tax yield would have to be earned by investors over the same holding period. In investment Case B for example, the 4.8 percent increase in rent was estimated on the basis of the same 14.8 percent return over the same 10 year holding period found to be optimal in the base case. The rationale for this procedure was that investors would seek <u>at least</u> the same after-tax return after TRA as they did <u>prior</u> to TRA, assuming competitive markets. However,

it was also pointed out that if increases in rents caused by TRA occurred uniformily over the economic life of the property, the maximum after-tax return and the number of years required to attain that return after TRA need not correspond to the same maximum return and investment holding period existing prior to TRA. To gain some insight into possible changes in holding periods that might occur due to TRA, two yield patterns were computed in accordance with equation (3) which was discussed earlier in the report. One yield pattern, shown in Diagram A, represents the base investment case prior to passage of TRA. It represents the after-tax yield that an investor would realize if the property were sold at the end of each year under base assumptions. The second yield pattern represents investment Case B after the 4.8 percent increase in rents have occurred to offset the effects of TRA.

To determine what the new holding period would be after the rent increase, the holding period was allowed to vary beyond 10 years for Case B after the change in rents due to TRA was included in equation (3). Note that although both investments provide the same 14.8 yield in the 10th year (by design), the peak return earned in investment Case B, or 15.0 percent, occurs during the 13th and 14th year. These results indicate that provisions in TRA should lengthen investment holding periods and increase yields on real estate investments. In other words, changes in TRA tend to nullify some of the incentives to sell property that were present because of the nature of tax deductions previously allowed on real estate (discussed in connection with Tables 4 and 5). Even though higher rents are likely to occur because of TRA, the substitution of higher rents for

DIAGRAM A



the tax write-offs allowed prior to TRA tends to neutralize tax influences on investment holding periods.[1]

While the above analysis implies slightly longer investment holding periods as a result of TRA, the more substantive question relates to the issue of whether investment holding periods and housing quality are related. In other words, by providing incentives for investors to own properties longer, will there be any systematic improvement in housing quality? Taubman (6) indicates that there may be some improvement because if investors know prior to construction that their investment holding period will be longer, they will tend not to "cut corners" in construction quality and sell properties shortly thereafter. This behavior would, in turn, make for more durable, easier to maintain properties. While there may be some merit to this view, it would seem that merely holding an investment longer would not provide more than a marginal, if any, improvement in housing quality. Rather, major improvement housing quality on a large scale, like any other economic commodity, requires an increase in effective demand. Simply inducing investors to own

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[1] It should be pointed out that a potential bias exists in the exercise just described. This possible bias arises due to "forcing" the investment yield to be 14.8 percent in year 10 in investment Case B by increasing the level of rents, then given the new level of rents, assuming that the new peak yield and optimal holding period are determined independently. This simulation exercise may violate any underlying term structure of yields that may exist after changes in TRA take effect and investor preferences concerning the timing of returns are revealed. If a bias exists, it is probably in the form of a yield that is slightly too high (15 percent) and a holding period that is somewhat short (13-14 years).

To determine the extent of any bias, additional runs were made for Case B before any change in rents due to TRA were considered. The holding period in which the yield reached its maximum was 14-15 years which is very close to the holding period estimated after the rent increases were considered. Further, the 15.0 yield, which is .2% higher than the base case yield of 14.8, seems reasonable for the extended term of the investment (ie, 10 to 14 years), assuming an upward sloping yield curve. Given these estimates, any bias resulting from the construction of the simulation exercise appears minimal.

properties longer, in and of iteself, would not seem to result in a significant improvement in housing quality.[1]

J. Subsidized Rental Housing and TRA

Based on the preceeding analysis, increases in rents for subsidized housing can also be expected to result from TRA. However, programs designated as serving low income families in accordance with the Act[2] are provided a more liberal write-off of construction period interest and taxes until 1982, at which time regular phase-in scedule also applies to such properties.[3] Further, the depreciation recapture credit will still apply to subsidized properties, although the period of ownership required for the credit has been increased from 20 to 100 months.

Since deferral of construction period interest and taxes has been seen to be a more important determinant of potential rent increases than other provisions in TRA, rents on subsidized properties will also eventually rise as the full phase-in schedule becomes applicable. Deferral of the recapture credit will also effect rents but will not have as great an impact on rents as complete elimination of the credit had in the analysis presented in the base case. This is because the credit allowed on subsidized properties is deferred from 20 to 100 months and not completely eliminated. Hence, only

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[1] Such a view implies that one car "cut corners" during construction and sell a property in a short period of time to an unwary buyer, before the quality of a property declines significantly. This also implies that many investor/buyers cannot assess building quality. While many such investments may be promoted by individuals to absentee owners in limited partnerships, etc. who do not possess a technical knowledge of construction, over time such practices would result in lower yields and eventually fewer partners.

[2] Such programs include Section 221 (d) (3), Section 236, Section 8 and Section 167 (k) among other programs.

[3] Fifty percent of construction period interest and taxes may be written off during construction with the remainder amortized over the following three years. The regular phase-in schedule for unsubsidized properties becomes effective in 1982.

the "time value of money" assocaited with the credit will be lost, not the credit itself. Since complete elimination of the credit was seen to affect rents only marginally in the base case (Table 9) it is unlikely that deferral of the credit on subsidized properties will have a material effect on rents. Therefore, to the extent that subsidized properties are similar to the base case investment presented here (in terms of equity requirements, financing and the relative proportions of land and improvement costs), rents can be expected to rise by a slightly smaller proportion as those estimated in investment Case B.

It should be pointed out however, that any future subsidy programs insured by FHA that may provide for more liberal borrowing provisions would be affected considerably more by TRA than tax treatment of similar programs in past years (such as Section 221 (d)(3) or Section 236). This is because much of the advantage of more liberal borrowing will be offset by deferral of the interest charges in future periods. Hence, any future programs providing more borrowing for investment in subsidized housing will be reduced in relative effectiveness by TRA.

V. RENTAL HOUSING AND OTHER POTENTIAL TAX CHANGES

Changes brought about by TRA definitely reduce, or moderate somewhat, the influence of taxes on the economic behavior of real estate investors. Elimination of the depreciation recapture credit amounts to an outright reduction in a tax shelter.

Amortization of construction period interest and property taxes, represents a movement toward tax neutrality, although not completely. Because imputed income, equivalent to the change in the value of a project as it is constructed, is not reported for tax purposes, it follows that deduction of these expenses should not be allowed during that period. Unless income is imputed during construction and expenses are identified properly and deducted, requiring expenses to be deferred and amortized against future income is clearly a second-best choice. On practical grounds however, it may be more expedient to do so.

In addition to changes in TRA analyzed in the first part of this report, many other changes have been suggested in recent years to close "tax loopholes" favoring investors in real estate. While there have been many varied suggestions concerning which tax policy is proper, the major changes that seem to be getting more serious attention are listed and briefly discussed below.

(a) Limitation of Artificial Accounting Losses (LAL). This provision was passed by the House of Representatives in 1976, but was eventually deleted from the final TRA. It would have required all construction period interest and property taxes, plus all artificial accounting losses (defined as that portion of annual reportable tax loss made up of the difference between accelerated depreciation and straight line depreciation) to be placed in a reserve account against which taxable income earned in future years would be charged.[1] This provision

[1] Referring back to Table 4 note that item (8) constitutes a reportable "tax loss" from year 1-6, while item (12) constitutes the cash flow after tax realized by the investor. With LAL, the losses shown in item (8), to the extent accelerated depreciation (6) exceeds straight line, plus construction period interest and taxes would be placed in a reserve against which reportable income (8) in years 7-10 and beyond would be charged.

would result in elimination of the practice of investors writing off most reportable "tax losses" against other earned income. Under LAL an investor would still probably report small reportable losses for a period of time, to the extent real economic depreciation is less than the straight line deduction, however these losses would not be as large in amount as presently reported. The remaining accounting loss would be used to increase the reserve in "loss years" and reduce the reserve in "income years." However in all years the investor would probably continue to earn some tax-free cash income.

The rationale for this tax treatment seems to stem from a recognition that accelerated depreciation charges are not indicative of economic depreciation and therefore give rise to reportable tax losses. Rather than eliminating accelerated depreciation methods and replacing them with a depreciation method more accurately reflecting economic depreciation, reportable tax-losses are simply deferred.

It should be added that implicit in LAL is the assumption that straight line depreciation is equivalent to economic depreciation since artificial losses are defined as the excess of accelerated depreciation charges over straight line depreciation. This may or may not be the case, as Taubman and Rasche (9) have pointed out.

The Act also contained a provision under which investors would be allowed to group all income and losses from real property owned in the determination of artificial losses. This provision would have nullified much of the original intent of LAL, as investors with a portfolio of real estate investments could group properties with reportable income with properties with reportable losses, still preserving much of the deductibility of artificial losses.[1] If properties

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[1] The net effect of the provision would be for investors to hold properties with reportable income longer, as this income could be grouped with losses generated from more recently acquired properties. Hence the total portfolio of properties would be held longer, on the average, with LAL.

were sold with deferred losses in reserves still remaining in the year of sale, the reserves would be used to increase the adjusted basis of the asset in the computation of capital gains.

(b) Full Recapture of Depreciation. This provision, presently in effect for many other Sec. 1231 assets such as business machinery, etc., simply requires that in the year of sale the difference between the original cost of an asset and the basis of the asset (usually cost less all depreciation) be taxed as ordinary income, to the extent the sale price of the asset exceeds its original cost. Any excess of sale price over original cost would then be taxed at capital gains rates. Presently, only the difference between total depreciation taken and total straight line that would have been taken, or excess depreciation, is taxed as ordinary income.

The rationale for this method seems to be that if an asset has been depreciated propertly, it would have an adjusted basis equal to its sale price in the year of sale. Therefore, to the extent that the sale price actually exceeds adjusted basis, the depreciation method used was too liberal. Hence, any difference between adjusted basis and original cost should be taxed as ordinary income (since the annual excess depreciation changes were used to reduce taxes at ordinary tax rates) and only the excess of sale price over original cost taxed at capital gains rates. This approach to taxation, like all others proposed, does not take into account the difference between nominal and real values in the sale year. Based on historical inflation rates, full recapture of depreciation would result in a substantial tax on nominal gains in the year of sale.[1] This would in turn induce investors to hold properties for considerably longer periods of time.

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[1] This would not only be true for real estate investment, as many other Section 1231 assets are presently taxed in this fashion.

(c) Limitation of Allowable Depreciation Methods. This provision would simply limit the methods allowable for depreciating improvements to techniques not including accelerated approaches. Alternatives that have been suggested might limit depreciation methods to straight line or reverse sum of the years digits.[1] In addition to changes in the method of computation, proposals have also been made that the useful tax life of these investments be made more "realistic" (i.e., longer), or more representative of the economic life of the improvement.

The rationale typically used in arguing in favor of these approaches is that real property improvements depreciate very slowly over time, hence use of accelerated depreciation methods in no way approximate economic depreciation. As a result, artificial tax losses develop because of accelerated deductions which are then used to offset other earned income thereby providing a "tax loophole" for real estate investors. Hence, choosing the method which closely approximates economic depreciation would eliminate artificial losses.[2]

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[1] Reverse sum of years digits comes from the work developed by Taubman and Rasche (7).

[2] This rationale can also be cited as a reason for LAL and full recapture of depreciation. All of these methods are techniques that have been proposed to offset the effects of accelerated depreciation and to eliminate artificial losses, The differences between them really lie in the areas of tax neutrality

A. Investment Yields and Potential Tax Changes.

In keeping with the previous section of this report dealing with TRA, the purpose of this section is to make estimates concerning potential changes in investment yields, rents and investment holding periods, that might result from the potential changes in the tax treatment of real estate just described. The methodology used here is the same that was used in evaluating the effects of TRA.

The first set of computations in conjunction with these potential tax changes were made to assess the relative impact of each provision, coupled with changes already brought about by TRA, on the after-tax yield determined in the base investment case. Column 1 in Table 11 shows the after-tax yield in the base investment case given that each specific provision is substituted for relevant base case provisions. For example, in the case of LAL, base case data were changed by establishing a reserve containing all construction interest and taxes, plus that portion of annual reportable tax loss made up by the excess of accelerated over straight line depreciation.[1] After tax cash flows (ATCF) from operating the property as well as after tax cash flow from sale (ATCFS) were computed given the same assumptions concerning increases in rents property values over time and other variables used in the base case.[2] Other provisions such as elimination of the depreciation recapture credit and amortization of loan fees required under TRA (per investment Case B) were also included in the computation. Hence in the case of LAL, the 12.4% yield shown in column 1 represents the after-tax yield

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[1] Recall that double declining depreciation was used in the base case.

[2] Recall that rents and property values were assumed to increase at the rate of 5% and 3.7% respectively. For a review of the other variables see Section IV of this report.

PERCENTAGE OF BASE CASE AFTER TAX YIELD AFFECTED
BY TRA AND POTENTIAL FUTURE TAX CHANGES

Tax Change	After-tax Yield Year 10[a]	% of Base Case yield Reduced by Provision[a]
TRA (Case B)	13.6%	8.2%
LAL	12.4	16.2
Full Recapture	11.2	24.3
Straight Line (40)	12.5	15.5
Straight Line (75)	11.6	21.7
Reverse SYD (40)	10.9	26.4
Reverse SYD (75)	10.6	28.4
LAL - Full Recapture	10.2	31.1
Straight Line (45) - Full Recapture	10.1	31.8
Straight Line (75) Full Recapture	9.5	35.8
Reverse SYD (40) - Full Recapture	9.1	38.5
Reverse SYD (75) - Full Recapture	9.0	39.2

[a] Includes appropriate changes in TRA as contained in investment Case B.

on investment that would be earned after 10 years in the base investment case, given LAL provisions and provisions in TRA regarding amortization requirements for loan fees and elimination of the recapture of depreciation credit, but before any offsetting rent changes occur to restore the base investment case yield of 14.8 percent.

Comparing the 12.4 percent yield in column 1 for LAL with the 14.8 percent return determined in the base case (prior to TRA) over the same 10 year holding period indicates a reduction in yield of 2.4 percent.[1] This represents a 16.2 percent reduction (column 2) from the 14.8 percent yield estimated in the base investment case.[2]

Continuing with Column 1 in Table 11, the recapture provision was incorporated into the base case by including, in the year of sale, the difference between the original cost and the adjusted basis of the property as ordinary income (hence taxed at ordinary rates) with the excess of sale price over cost taxed at capital gains rates. Provisions concerning construction interest, property taxes, loan fees and the elimination of the depreciation recapture credit, per treatment in inevestment Case B were also included in the analysis.[3] The overall reduction in yield to 11.2 percent represents 24.3 percent of the 14.8 percent yield found in the base case.

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[1] This computation for LAL applies only to this investmtnet. If grouping real estate investments with reportable income and losses is allowed this estimate would not apply.

[2] It should be pointed out that the reduction in yield brought about by LAL excluding TRA effects cannot be directly obtained by taking the difference in amounts reported in column (2) or 8.2% and 16.2% respectively. Differences in yields computed in each case are not strictly additive and only provide an approximation of the effect of each provision independently.

[3] As with LAL, provisions in TRA per investment Case B were included because it was assumed that future legislation would add more requirements to the existing Act rather than repealing TRA and making only individual changes. Individual changes, such as LAL or full recapture only, can be analyzed by simply modifying the investment model used in this study. However in the interest of time and space, full detail on all combinations of potential legislation could not be provided.

Two additional provisions were considered individually and reported in Table 11. Restriction of depreciation methods to either straight line or reverse sum of the years digits depreciation for useful tax lives of 40 to 75 years were considered for both cases. As shown in column 2, reduction in yields brought about these changes coupled with TRA provisions would reduce the 14.8 percent base case yield to yields ranging from 12.5 percent in the case of straight line depreciation with a 40 year tax life, to a yield of 10.6 percent if reverse sum of the years digits with a 75 year tax life were required. These patterns would be expected given the change from a more liberal depreciation allowance (per the double declining method used in the base case) to depreciation methods allowing smaller deductions in the early years of an asset's life.

All tax provisions considered individually were also analyzed by coupling each provision with the full recapture of depreciation provision. Results are shown in the lower half of Table 11. As would be expected, the reduction in yield by combining these provisions were even more marked, ranging from about 10 percent in the cases of LAL with full recapture and straight line depreciation over 40 years with full recapture to 9 percent in the case of reverse sum of the years digits depreciation over 75 years with full recapture. These second set of computations, which include full recapture of depreciation, show that between 30 to 40 percent of the base case yield would be affected by such provisions, should they be imposed. To the extent that these methods best represent economic depreciation however, some idea of the magnitude of tax shelters in real estate can be obtained from these lower yields.

It should be noted that the full recapture of depreciation provision taken alone accounts for reduction in yield almost equivalent in amount to the more sweeping changes in allowable depreciation methods (i.e. straight line

75 years, reverse SYD 40, 75 yrs.) taken individually. As shown in column 2, the reduction in yield initially be brought about by full recapture would be approximately 24 percent as compared to the more stringent depreciation requirements which would initially reduce yields in the range of 21 to 28 percent. However, such a provision would initially reduce yields more than LAL, which clearly would have a more moderate impact.

B. Estimates of Rent Changes in Response to Potential Tax Changes.

As in the base case, estimates were made of the percentage increase in rents over base case rents (Table 4) required to offset changes in TRA and each of the tax provisions for which initial decreases in yields were computed and shown in Table 11. The procedure used to estimate these changes in rent was the same procedure used when evaluating TRA alone (per equation 4 and discussion thereof). In other words, the underlying assumption in this analysis is that depreciation methods presently allowable such as double declining balance, do provide artificial losses to real estate investors (see Table 4). However these losses are anticipated by owners of rental housing and taken into account in return on capital or yield expectations. Hence, to the extent that charges allowable under accelerated depreciation methods would provide more than a competitive return on capital, price competition in the rental housing market would ultimately result in owners passing through that portion of accelerated depreciation in excess of economic depreciation to renters in the form of lower rents.[1]

Using the after-tax yield of 14.8 percent earned over 10 years in the base investment case as a lower-bound or minimum acceptable return for real estate investors, the required increases in rent necessary to offset TRA requirements combined with each potential future tax change discussed in the previous section are itemized in Table 12.[2] However, as can be seen in Table 12, there are two estimates of rent changes, one for investors with a 50 percent ordinary tax rate and an estimate for investors with a 35 percent rate. The need for these

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[1] As pointed out previously whether or not a full pass through of these tax provisions occurs depends on the degree of competitiveness in the rental housing market. Further, the time over which the changes would be transmitted through the housing market would depend on the existing supply-demand conditions at the time the changes occurred.

[2] As pointed out earlier in the analysis of TRA only, there is potential bias in these estimates that may result from "forcing" a given return in a specific year. This possibility is explored in the next section of the report which deals with yields and investment holding periods.

TABLE 12
ESTIMATED CHANGES IN RENTS GIVEN TRA AND
ADDITIONAL CHANGES IN TAX TREATMENT OF REAL ESTATE

Tax Change	Rent changes including TRA Provisions	
	50% Tax Rate[a]	35% Tax Rate[b]
TRA (Case B)	4.8%	-
LAL	8.7	19.4%
Full recapture	13.4	22.3
Straight Line (40)	10.1	21.8
Straight Line (75)	14.5	24.4
Reverse SYD (40)	17.7	26.3
Reverse SYD (75)	19.0	27.0
LAL - Full recapture	15.6	23.0
Straight Line (40) - Full recapture	18.S	25.7
Straight Line (75) - Full recapture	21.7	27.8
Reverse SYD (40) - Full recapture	24.1	29.4
Reverse SYD - Full recapture	24.9	29.9

[a] With a 30% capital gains rate

[b] With a 20% capital gains rate

estimates arises from the fact that unlike the more minor changes in TRA, if these various provisions were enacted, there would be a definite change in the marginal investor and his attendant tax rate, when compared to the investor assumed to determine market prices in the base case. This follows because as the effect of reportable tax losses are neutralized, to a greater or lesser degree, by the various changes in tax treatment being considered, advantages formerly enjoyed by higher tax bracket investors relative to lower tax bracket investors are reduced. Hence we would expect more lower tax bracket investors investing in real estate.[1]

To provide a range of estimated rent changes given possible changes in the marginal investor and his attendant tax rate, two assumptions are made concerning taxes. The first assumption is that no change in the relevant marginal tax bracket would occur. Hence rents would have to rise to bring about the same 14.8 percent after tax yield earned in the base case. Estimates in column 2 are based on the second assmption that if the marginal tax bracket of most real estate investors declined to 35 percent (with a 20 percent capital gains rate), as a result of any of the potential changes detailed in Table 12, the after-tax yield earned on investment would have to be 19.4 percent for that investor. This latter yield was estimated by assuming that if the after-tax yield of 14.8 was acceptable to an investor with a 50 percent tax rate, a before tax yield on an equivalent investment would have to be 29.6 percent to induce investment.

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[1] An analogy can be drawn here from the municipal bond market if tax-free municipal bonds were no longer tax-free. Clearly before-tax yields would have to increase in such a case and since lower tax bracket investors would earn a higher after tax return than higher tax-bracket investors, more low tax bracket investors would purchase the bonds. How far the relevant tax rate would fall before the marginal investor would be indifferent between the no-longer tax exempt municipal bonds and other alternatives is difficult to estimate and would depend on whether any other tax sheltered investments are available. However a 35% tax bracket is commonly cited as the rate making investors relatively indifferent between tax exempt securities and other investments. Hence it is used here as an estimate of the tax rate that would make the marginal investor indifferent between real estate, assuming the proposed changes in tax treatment being considered here remove much of the tax shelter from real estate, and other investments.

Assuming that the tax changes being considered here, in addition to changes in TRA, effectively eliminate, or neutralize tax shelters in real estate and that there is no change in risk associated with the investment due to changes in tax treatment, then if the 35 percent tax bracket represents the rate of taxation at which the marginal investor indifferent between real estate and other investment, the after tax yield earned by such an investor would be approximately 19.4 percent (29.6% X 1 - .35).

Making an estimate of rent increases using an after tax yield computed in the manner just described is precarious to say the least. Since we know that the risk associated with real estate investments will increase due to increases in rent (which are more risky) in place of the more certain tax shelter, rents should increase by more than a dollar for dollar trade-off of rent for tax shelter. Further, if the changes considered here do not completely eliminate the tax shelter aspects of real estate, which is very likely unless a method of depreciation is used that results in the equivalent taxation of income from real estate compared to alternative investments, the relevant tax rate used in estimates made here would be higher than 35 percent. This is because the reduction in yields would not be as profound for higher tax bracket investors and rent increases necessary to offset changes in tax treatment would not be as large. Further, not much is known concerning the role of tax depreciation policy and returns on capital in various industries. Hence any sweeping change in depreciation policy in the entire economy could affect returns on capital differently, depending on the industry. This could significantly affect returns to real estate investors differently from what is assumed here.

Given the above caveats, estimates of increases in rent in response to changes in potential tax treatment in Table 12 represent two extreme cases. As might be expected, the potential tax changes having the greatest impact on

rents are the same as those having the greatest impact on the base case yield (pointed out in Table 11). Under the assumption that the relevant tax rate for the analysis is 50 percent, the pattern of potential rent increases, including change already brought about by TRA, range from a low of 8.7 percent in the case of LAL to a high of 24.9 percent if reverse SYD depreciation over 75 years with full recapture were required. In the event that 35 percent were to become the relevant tax rate for real estate investors, the range in rent increases is much more narrow. Increases in rent under that assumption range from 19.4 percent with LAL to 29.9 percent if reverse SYD depreciation over 75 years with full recapture were required.

The reason why the range in rent increases is not as large in the 35 percent tax bracket computation can be readily explained. It should be noted in Table 12 that the estimated increases in rents (over base case rents) in both columns begin to narrow as the tax change becomes more stringent. For example, in the case of LAL estimates of rent increases range from 8.7 to 19.4 percent. However, when reverse SYD depreciation over 75 years with full recapture is considered, the range narrows from 24.9 to 29.9 percent for the two tax rate assumptions. This pattern follows from the observation that potential tax changes included in the lower one-half of the table (with the possible exception of LAL with full recapture and straight line depreciation over 40 years with full recapture) eliminate much of the tax shelter in the base investment case. In both reverse SYD cases with full recapture and in the case of straight line depreciation over 75 years, the depreciation charges allowed in the initial years of the investment would be very small in relation to charges allowable with double declining balance used in the base case. This reduction significantly lowers artificial losses which are more valuable to high tax bracket investors. Further, with full recapture of depreciation being taxed at ordinary tax rates, and only the

's of sale price over cost taxed at capital gains rates, high tax bracket stors pay more taxes than low tax bracket investors in the year of sale. same observations can be made regarding both reverse SYD for 40 years with . recapture and straight line depreciation over 75 years with full recapture, ept those two provisions are not quite as stringent. Hence the rent neces- y to restore a 14.8 percent return for the 50 percent taxpayer/investor and 2 percent return for the 35 percent taxpayer/investor over 10 years are very nilar for all three of these changes because of the reduced effect of tax elters which are more valuable to the high tax bracket taxpayer.

Another way of analyzing what is occurring as a result of these potential hanges in tax treatement can be seen in the following diagram. Diagram B repre- ents the relationship between after-tax yields and tax rates for investors in eal estate (RE) and all other non-tax sheltered investments (OI). The line epresenting real estate (RE) is positively sloped because tax sheltered in- vestments provide higher yields to investors in higher tax brackets. The (OI) curve represents other investments and is negatively sloped because no tax shelters are assumed to be a part of these investments, hence lower tax bracket investors realize higher after-tax yields than higher tax bracket investors, or income from these investments is taxed progressively.

Looking again to Diagram B, if a moderate change in the tax treatment of real estate investment, such as LAL, occurred there would be immediate shift in the RE curve downward and to the right (RE') as some of the tax shelter (per provisions in LAL) is removed. This would make the investment in real estate less desirable to all investors in the short-run.[1] The slope of RE' differs from RE because with the reduction in tax shelter the immediate reduction in

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[1] This initial shift in after-tax returns corresponds to the impact on yield brought about by the various changes in tax treatment considered in Table 11.

DIAGRAM B

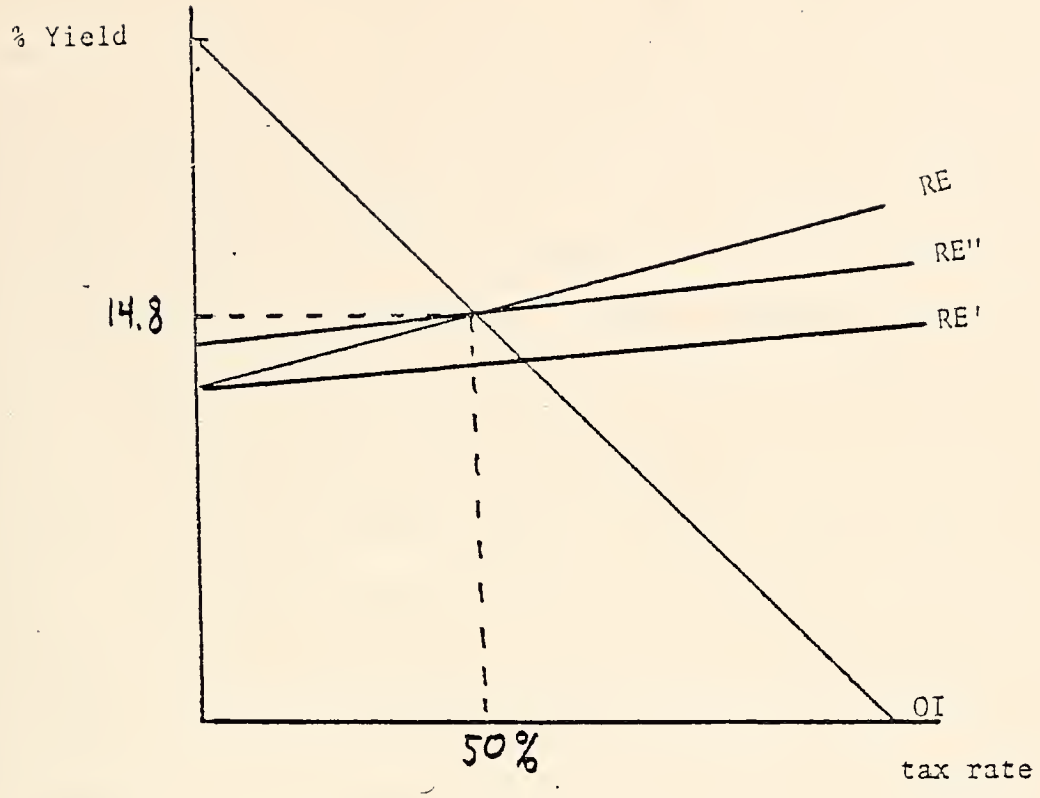
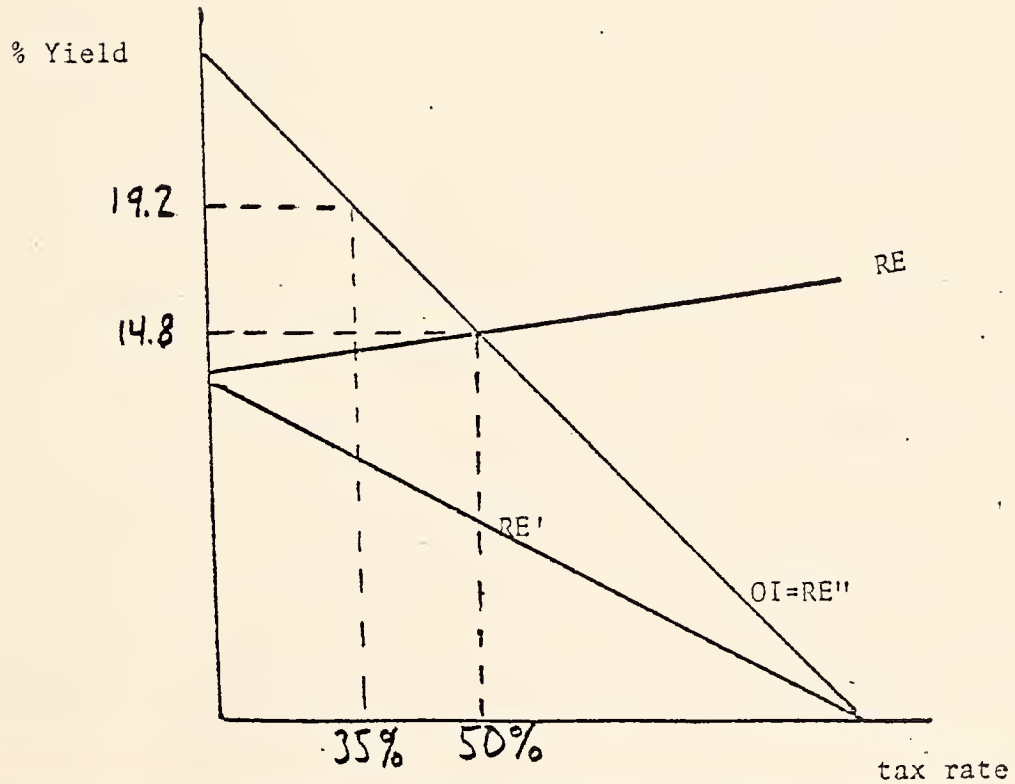


DIAGRAM C



yield would be greater for the high tax bracket investor as opposed to the low tax bracket investor. However, if we assume that rents eventually increase to restore the same 14.8 percent return to the 50 percent taxpayer/investor, the yield curve RE' would translate upward and to the left as shown with RE". This new curve (RE") would tend toward its intersection with RE (by assumption) to provide the same after tax yield to the 50 percent taxpayer/investor, after rent increases. However, it should be noted that the slope of RE" is considerably different from RE indicating that after tax returns to lower tax bracket investors are higher after the change in tax treatment because some of the tax shelter has been neutralized and made up with rent increases. This occurs as the amount of tax shelter is reduced and is made up with rent increases, hence the relative proportion of tax shelter in total after-tax cash flow (ATCF) diminishes. Therefore, the investment becomes increasingly attractive to lower tax bracket investors. However, as long as there is any tax shelter remaining, even after the change in tax treatment, the cure RE" will have a positive slope as that attribute is still more valuable to higher bracket investors.

If the above analysis were taken to the extreme and a method of tax treatment were adapted that completely neutralized tax shelters in real estate, or at least made the tax treatment of real estate investments commensurate with other investments (eg. corporate bonds, stocks, etc.) the curve RE" would rotate around and become parallel or overlay OI as rent increases occurred. In that case, the 35 percent tax bracket investor would become the marginal investor and earn a higher after tax yield than the 50 percent tax bracket investor, as the ATCF from real estate would contain no more tax shelter than other investments and income would be taxed progressively.

Hence the data in Table 12 show the increase in rents that would occur given each potential tax treatment under the two extreme assumptions regarding

the tax bracket of the marginal investor. In one case it is assumed no change in the marginal tax rate will occur under any of the proposed changes in tax treatment. Hence rent changes are computed on the basis of a prevailing 14.8 percent after-tax yield regardless of the change in tax treatment. Implicit in the other extreme is the assumption that any of the proposed changes in Table 12 completely eliminates tax shelters and therefore the after-tax return of 19.2 must be realized by the 35 percent tax bracket investor. Because of these assumptions it is clear that the estimates made in Table 12 for each tax rate will probably be more realistic for some of the proposed changes and not for others. For example, under LAL, which is certainly a more minor change in terms of affecting tax shelters than reverse SYD over 75 years with full recapture, the estimate made for the 50 percent tax bracket investor is probably more realistic than the estimate made for the 35 percent tax bracket investor, as the tax change is not as sweeping. On the other hand, in the case of reverse SYD over 75 years with full recapture, the estimate made for the 35 percent tax bracket investor may be more realistic. Obviously, in the remaining cases estimates of rent increases would represent a range, with the most realistic estimate falling somewhere between the two extremes depending on the impact of each proposed change on the tax shelter and the appropriate tax bracket of the new marginal investor in each case.[1]

One final observation should be made in connection with the estimates made in Table 12. It has been pointed out that the reduction in the range of

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[1] Obviously what would happen in fact, would depend on the severity of the reduction in the tax shelter brought about by each provision. Further, as these reductions in tax shelter occurred, the rotation of the RE" curve shown in Diagram B would not pivot at its intersection with RE. Rather, the RE" would shift upward along the OI curve, in addition to rotating, to reflect the fact that the tax rate of the marginal investor would actually change in response to the severity of the reduction in tax shelter. However, predicting the change in the relevant tax bracket for the new marginal investor in response to each change in tax treatment listed in Table 12 would be extremely difficult. Hence only the two extremes are considered.

estimated rent increases for each respective tax rate decreases as the proposed tax treatment reduces tax shelters. However this range will not converge, as the change in rents necessary to provide the 35 percent tax bracket investor with his required yield (if tax shelters were completely eliminated) would be higher than the change in rent necessary to provide the 50 percent tax bracket investor with his required yield. This pattern can be seen in Diagram C, where the initial reduction in yield brought about by a more sweeping change in tax treatment (eg. reverse SYD over 75 years with full recapture) is depicted by RE' which now takes on a negative slope due to the effect of income taxes. As rents rise and as RE' translates and rotates toward OI (RE"=OI), the amount of yield (vertical axis) to be made up with rent increases is higher for the 35 percent taxpayer/investor than for the 50 percent taxpayer/investor. This is not only due to the change in the tax treatment per se, but also because of the assumed change in the tax rate of the new marginal investor. Hence in the extreme case, rents would increase to offset both the change in tax treatment and the change in the relevant tax bracket for the new marginal investor.[1] More taxes would be paid by all investors in real estate (ergo, indirectly by renters). Further, the deadweight loss or the excess yield earned by high tax-bracket investors over the yield earned in the base case by the marginal investor with a lower tax bracket, is eliminated. However it should be pointed out that even with the more

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[1] This observation is made under the assumption that all tax changes are reflected in rents and that no significant reductions in return on capital will occur generally in the economy as a result of these more sweeping changes in tax depreciation policy. If an overall reduction on return on capital did occur, the changes observed in the RE curves in Diagrams B and C would be made in relation to a new OI curve parallel to the OI curve in Diagram C, but closer to the origin. However as pointed out previously, reductions in tax-shelters through changes in depreciation policy will also generally increase risk to investors, hence this effect must also be reflected in increased yields on all investment affected. This would have an opposite effect on the present OI curve.

sweeping changes in tax treatment there is no assurance that all tax shelters have been eliminated, or "over eliminated" for that matter. This problem involves determining what pattern of depreciation for tax purposes best approximates economic depreciation. This question should be explored before any proposed change in tax treatment is seriously considered.

C. Changes in Investment Holding Periods and Yields After Rent Adjustments

As was the case when changes in TRA were considered earlier in this report, changes in investment holding periods and yields after increases in rents have been estimated due to tax changes discussed in this section are considered here. In other words; "Would the more sweeping changes in depreciation policy affect investment holding periods and yields, given rent increases?" To investigate this question, a series of additional simulation runs were made given the percentage rent increases, for investors in the two tax brackets, for each change in tax treatment considered. The intent of these runs was to determine the new after-tax yields and holding periods for investment, given each of the tax changes considered (in addition to TRA) and the rent increases shown in Table 12. The results for all of these runs are presented in Table 13. Recalling that the optimal investment holding period under base case assumptions was about 10 years and that when TRA was considered alone the holding period increased to about 13-14 years, at first glance there appears to be a general increase in both yield and holding period for each of the tax changes considered. However, some inconsistencies in results shown in Table 13 are apparent and are caused by the construction of the simulation exercise. For example in the 50 percent tax bracket column, in the case of LAL with full recapture and straight line depreciation over 40 years with full recapture, both holding periods are similar, however the yields are quite different (16.2% and 15.8% respectively). This result indicates an upward bias in yields in one or both cases because of

TABLE 13
ESTIMATED CHANGES IN YIELDS AND INVESTMENT HOLDING PERIODS AFTER RENT INCREASES DUE TO TRA AND POTENTIAL TAX CHANGES

Tax Change	50% Tax Rate		35% Tax Rate	
	Yield	Holding Period (Yrs.)	Yield	Holding Period (Yrs.)
TRA	15.0%	13-15	-	-
LAL	15.1	13-19	19.3%	10-14
Full Recapture	16.0	20-25	19.7	15-24
Straight Line (40)	14.9	10-16	19.3	9-13
Straight Line (75)	14.8	9-14	19.3	9-13
Reverse SYD (40)	14.8	9-16	19.3	9-13
Reverse SYD (75)	14.8	9-13	19.3	9-13
LAL - Full Recapture	16.2	20-25	19.8	16-22
Straight Line (40) Full Recap.	15.8	20-25	19.6	14-23
Straight Line (75) Full Recap.	15.4	16-25	19.4	12-21
Reverse SYD (40) Full Recap.	15.4	18-25	19.4	12-20
Reverse SYD (75) Rull Recap.	15.2	16-22	19.3	10-18

"forcing" the 14.8 percent yield in the 10th year when the increases in rents were determined.[1] In other words by constraining the investment yield over a 10 year period in the determination of rent increases, an over or under - estimate of rent changes necessary to bring about a given yield pattern beyond 10 years can result. Further, estimates of rent increases made in Table 12 may themselves be biased if the "true" yield and optimal holding period differ from the 14.8 percent yield and 10 year holding period used as the constraint in the simulation.

To determine the extent to which holding periods might be influenced by over or under estimates of rent increases, each of the changes in tax treatment in Table 13 were included in the base investment case data (in addition to TRA provisions) and the holding period corresponding to the highest yield (in the absence of any rent increase due to the tax change) was determined. Holding periods did not prove to be significantly different for either tax bracket and results are shown in column (a) in Table 14.

To compensate for the affect of any upward or downward bias in rent increases on yields, a yield curve was constructed using U.S. Government obligations as of the end of 1976. Percentage changes in yields corresponding to differences in the maturity of those obligations were computed in 5 year intervals. These percentage changes were then applied to difference between holding period estimates in column (a) in Table 14 and the 10 year holding period found to be optimal in the base case. In other words, if an increase in holding period beyond 10 years was indicated in Table 14, an increase in the 14.8 percent base case yield was made in proportion to the yield - maturity structure of U.S. Government obligations as of the end of 1976. Adjustments in yields were not necessary

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[1] This method of estimation is necessary because of the simultaneous problem encountered in the determination of rent increases, yield increases and holding period changes in response to a given change in tax policy.

TABLE 14
ESTIMATED CHANGES IN YIELDS AND
HOLDING PERIODS DUE TO TRA
POTENTIAL TAX CHANGES -
ADJUSTED FOR RENT CHANGE BIAS

Tax Change	(a) New Holding Period (Yrs)	(b) Yield 50% Tax Bracket	(c) Yield 35% Tax Bracket
LAL	15-20	15.1	19.3
Full Recapture	20-25+	15.3	19.7
Straight Line (40)	11-17	14.9	19.3
Straight Line (75)	12-16	14.9	19.3
Reverse SYD (40)	14-23	15.1	19.4
Reverse SYD (75)	12-21	15.1	19.4
LAL - Full Recapture	20-25+	15.3	19.7
Straight Line (40) Full Recapture	20-25+	15.3	19.7
Straight Line (75) Full Recapture	20-25+	15.3	19.7
Reverse SYD (40) Full Recapture	20-25+	15.3	19.7
Reverse SYD (75) Full Recapture	20-25+	15.3	19.7

in all cases as some yields in Table 13 remained unchanged even after the "yield curve adjustment." The set of yields adjusted for yield curve effects are shown in column (b) in Table 14 for the 50 percent taxpayer/investor. A similar adjustment was made for the 35 percent taxpayer/investor and is shown in column (c).

Generally, the results shown in Table 14 concerning holding periods are consistent with results shown in Table 13. The most notable exceptions are straight line depreciation over 40 and 75 years and reverse SYD depreciation over 40 and 75 years. In these cases the holding period estimates made in Table 14 are considerably longer than those shown in Table 13. This is because as substantial amounts of tax shelter are removed and replaced with rent increases, the combined effect results in a general "flattening" of the yield curve for real estate investments.[1] In the remaining cases, particularly those with full recapture of depreciation provision, the holding period estimates increase markedly for periods ranging up to 25 years. This latter relationship indicates that full recapture of depreciation has a definite impact, both by itself and in tandem with other tax changes, on holding periods. This pattern results from a considerable reduction in tax shelter, brought about by full recapture of depreciation, and because of the large tax liability likely to be encountered in the year of sale, hence an incentive exists for investors to hold properties longer. (While this inventive exists, it should again be stressed that longer investment holding periods does not necessarily result better housing quality. This point has been explored in Section IV part I-3 of this paper.)

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[1] It should be recalled from Diagram A, that with the existing tax treatment in the base case and even after the effects of TRA, the yield pattern was peaked. This pattern tends to flatten as tax shelters are removed.

Finally, to determine any significant bias in rents estimated in Table 12 due to the simulation constraints,[1] the yields and holding periods estimated in Table 14 were substituted in the simulation as new constraints, and rent increases were re-estimated for all potential tax changes. Rent increases estimated using the new constrains and results estimated in Table 12 never deviated by more than 2 percent in the simulation runs.

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[1] The 14.8 percent yield, 10 year holding period and 19.2 percent yield and 10 year holding period constraints for the 50 percent and 35 percent tax bracket investors, respectively.

VI. FUTURE TAX POLICY AND RESIDENTIAL RENTAL REAL ESTATE

Based on the Tax Reform Act of 1976 and other suggestions regarding "tax reform", there can be little doubt that an impetus presently exists for removal of tax shelters available for real estate investors. A critical question that must be raised in regard to these reforms has to do with the relative advantages and disadvantages to taxpayers and renters from changes in tax policy. This section briefly considers these factors as well as the more general impact such changes would have on the housing market.

A. Tax Reform and Equity - Renters and Homeowners

The obvious advantage of pursuing tax reform through one or more of the tax changes considered here involves the progressive taxation of earnings from real estate investments. As has been seen, the more sweeping changes in the tax treatment of real estate considered here result in higher tax bracket investors paying progressively more taxes on investment income. The deadweight loss in taxes caused by the difference in tax brackets between the marginal investor and investors in successively higher tax brackets is reduced as tax shelters are eliminated.

On the other side of the coin however, changes in tax treatment necessary to bring about progressive taxation of income comes at the cost of increased rents to tenants in rental properties. Based on the observation that the rental housing market is competitive, it is reasonable to assume the changes in tax policy are reflected in lower after-tax yields in the short-run. However, in the long run, changes in rent must come about to offset these tax changes if a competitive return on capital, as well as a continued supply of new rental housing, is to be maintained. While the full effect of tax changes may not be shifted forward in the form of higher rents, it is probably safe to say that most of the tax effect would be.

Increases in rents alone may not be necessarily inappropriate for renters because, after all, their federal income tax liability may become lower as higher tax bracket investors pay more tax on income. However, the question of the tax treatment of homeowners, who are provided with far more in the way of tax shelters than owners of rental properties, must unavoidably be addressed before any tax reforms concerning rental property can be seriously considered. As Aaron (1) and Diamond and Tolley (8) among others have shown, tax shelters for homeowners result in significantly lower after-tax housing reforms affect only the owner of rental properties and not homeowners, these relative costs will widen and more renter households will become homeowners.[1] However for those, who because of wealth constraints, stage in family life cycle or on the simple basis of freedom of economic choice either must, or prefer to be renters, such a policy is clearly discriminatory. Indeed the passage of TRA, as has been shown here, will put upward pressure on shelter costs for renters relative to homeowners, while the same Act mad homeownership even more attractive by reducing capital gains taxes paid by retired persons when they sell their principal residence.

Given the present and widening inequity that exists between homeowners and renters, it is obvious that as more tax shelters are removed from investment in rental housing this inequity will become even more accute. Consequently, if additional "reforms" are considered for owners of rental properties it is clear that additional "reforms" must be applied to homeowners or some substitute tax or subsidy policy provided for renters to reduce the inequity that arises simply because one chooses to own a house rather than rent one.

Clearly in light of the above discussion, the "best" tax policy that could be followed would be to require homeowners to impute income from ownership of a

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[1] For an estimate of the shift due to TRA see Diamond and Tolley (8).

dwelling if deductions for mortgage interest and property taxes are continued to be allowed, or not to impute income and disallow these deductions. Owners of rental properties should be allowed to deduct depreciation in accordance with a technique more closely resembling economic depreciation. With these reforms, owners and renters would be treated more equally from the standpoint of taxation. Both the choice of housing form and the allocation of resources used in housing would occur more in response to the price system.

In the absence of such reform, particularly with respect to the tax treatment of homeowners, other tax policies would have to be implemented for renters to maintain reasonable parity should more tax shelters be removed from real estate investment. Such policies affecting only renters, might include income tax credits, or property tax and mortgage interest pass throughs. Tax credits would have to be large enough to at least offset any elimination in tax shelters, and then some, if the inequity between owners and renters is to be reduced. In the case of a mortgage interest and property tax pass through, this would be done on some pro-rata basis (eg. based on square footage, etc.) and is tantamount to giving renters the same deductions as homeowners, with no imputed income required of either. These deductions would still have to be allowed for owners of rental properties, however because if they were eliminated and given only to renters, increases in rent would offset any benefits to tenants.[1]

An additional alternative to offset the effect of the removal of tax shelters on renters would be to provide a rent subsidy by a Federal agency such as HUD. Rent supplements could be paid out to tenants to reduce their shelter costs and bring about more equity in comparison with homeowners. Although this alternative would bring about more equality in shelter costs, it would also shift the administrative burden from the Treasury to HUD, probably at no small cost. Such a

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[1] This point is also made in Diamond and Tolley (8).

program would require certification, verification, monitoring and many other administrative burdens whose costs, in addition to subsidy payments, would likely offset any benefits from tax increases to the Treasury Department.

B. Tax Reform and the Housing Market.

Given the problems concerning the equitable tax treatment of homeowners and renters, there are other market outcomes that must be considered should tax shelters be eliminated. First, it is well established that because of tax shelters to both homeowners and renters (via owners of rental units) there is a vast over-investment in housing stock in the U.S.[1] Obviously if tax shelters were eliminated, the after-tax cost of shelter would rise for both owners and renters who would consume less. However a second order effect that must be considered involves the possibility of a general reduction in income tax rates because of increased tax revenues resulting from the elimination of tax shelters. Such a change would tend to offset the reduction in housing consumption, with renters, who are generally made up by the poor and elderly, fairing better than homeowners because of the present inequity in tax treatment.

1. Effects on Physical Characteristics.

Should tax shelters be eliminated only on rental property, the market effects would be much different. In addition to a pronounced shift from renter to homeowner status, new rental units would become smaller in physical size as rents rise in response to the elimination of tax shelters. This response would come about because if tax shelters are removed from rental housing, it would most likely take the form of a modification in depreciation policy.[2] These changes would increase rents, which would in turn affect the demand for rental

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[1] See Aaron (1) for an analysis of this issue.

[2] This modification would include LAL and full recapture of depreciation in addition to changes in depreciation methods.

housing service.[1] Producer/investors will respond by making the appropriate substitution among factor inputs in building new rental units. Since the after-tax cost associated with building improvements will rise relative to land costs, as the overall level of housing service is reduced in response to higher rents, more land will be used in proportion to building improvements. Hence people will live in smaller rental units but on relatively larger plots of land.

2. Economic Life and the Quality of Rental Housing

Some researchers have indicated that a modification in depreciation policy will increase the economic life of rental properties. Essentially, the claim is that because the excess of accelerated depreciation (as used presently) over economic depreciation is passed through to renters, rents are lower than they would be if only economic depreciation were allowed. By allowing accelerated depreciation, as rents decline over time due to economic depreciation, the margin between rents and operating expenses will converge sooner, hence buildings become unprofitable sooner and are demolished or abandoned.[2]

This conclusion is probably largely inaccurate because although the margin between rents and operating expenses may become smaller sooner due to accelerated depreciation, the owner may still be earning a competitive economic profit. This follows because of the tax write-off associated with accelerated depreciation which also must be considered in the analysis. The tax effect of this write-off when added to the margin between rents and operating expenses represents the return to investors (see Table 4), not simply the margin between rents and operating expenses. As long as this tax-effect is properly accounted for in measuring returns, there should be little or no difference in the economic life

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[1] This assumes no change in over all income tax rates because of increased tax revenues.

[2] See: Taubman (6). This assumes that a structure is depreciated over its initial useful tax life once only. However, in practice, since a new depreciable basis and tax life is established each time a property is turned over, rental properties are probably depreciated over a total number of years far greater than the initial useful tax life.

of rental properties due to depreciation policy. In fact, under present tax arrangements, as long as accelerated depreciation is based on nominal values and properties are turned-over regularly to re-establish a new depreciation basis for the next owner, it may well be that run-down properties remain in use somewhat longer than they would if only economic depreciation were allowed. This is particularly true if the allocation of value between building and land (which is non-depreciable) for tax purposes is distorted by the owner and the IRS can be convinced that a property has an economic life of at least 20 years.[1]

In sum, it can be strongly argued that while present depreciation arrangements probably result in an over-investment in physical improvements relative to land in the production of rental housing service, which is a serious consideration in resource allocation, it probably has little effect on the economic life of rental property. The question of useful economic life would seem to have more to do with the demand for maintenance and upkeep, which is in turn a function of prices and income, and other variables such as neighborhood characteristics and externalities.[2]

3. Other General Market Effects.

As pointed out in the analysis of TRA, other market affects may become important depending on how any additional "tax reforms" are implemented. For example, it has been shown that if only new properties are affected by such changes, as opposed to all existing properties, a windfall gain would be enjoyed by existing property owners because of increase in rents with no added

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[1] A strong incentive exists for owners to distort the allocation of value and argue for an economic life of 20 years on older properties. This is because the more value allocated to the building, the more the depreciation that can be charged. Further, if a building has an expected life of at least 20 years it qualifies for a 125% of straight line depreciation charge-off.

[2] The same general arguement has been made earlier in the paper concerning investment holding periods and housing quality.

risk. The size of this windfall would be much larger, should any of the methods analyzed in Section V of this report be adopted, then was the case with windfalls from TRA. Further, if owners of existing properties could continue to use accelerated depreciation on any additions or improvements made after tax changes affecting new properties were enacted, this would spur additional improvements in inner-city areas and lengthen the economic life of existing structures.

C. Tax Reform and Subsidized Housing.

Many of the effects of tax changes discussed in this section will apply equally to subsidized housing supplied by the private sector, assuming such suppliers are not exempted. Rents on units affected by modification or repeal of accelerated depreciation would increase as they would on any other units. In this event, since most current rental housing programs rely heavily on rent supplements (eg. Sec. 236, Sec. 23, Sec. 8) the government would pay most of the increases. However, for units constructed under older programs (Sec. 221 (d) (3) which relied on interest rate subsidies, rent increases will have to be paid by tenants, as owners earn windfall returns. This is because rents on these projects are determined by market surveys of existing unsubsidized units for which higher windfall rents would be occurring.

VII. SUMMARY AND CONCLUSIONS

The objective of this report was twofold; first, to analyze the effects of the Tax Reform Act of 1976 (TRA) on investment returns in rental housing and second, to consider the effects of additional tax reforms that might affect investment returns in the future. With respect to each of these objectives effort was concentrated primarily on estimating rent increases in response to changes in various tax provisions and changes in investment holding periods and yields on real estate investments. Other market effects such as effects on housing quality, shifts in renter-owner status as well as changes in the economic life of structures and effects on subsidized housing were also considered to a lesser degree.

Using a base investment case which consisted of data available on cost, rents, expenses, financing and other pertinent information for a 120 unit garden apartment complex located in the midwestern U.S., effects of TRA and potential future tax reforms were considered. Although the data were compiled for a project located in the midwest, much of the data corresponded closely to construction costs, land cost, financing and operating characteristics of properties analyzed in a more broadly based study on tax incentives and multi-family real estate investment previously conducted for HUD. Hence, results from this study are thought to be somewhat representative of multi-family real estate investments.

Results indicate that based on provisions contained in the Tax Reform Act affecting amortization of construction period interest and taxes, amortization of loan fees and elimination of the excess depreciation recapture credit, a long run increase in rents in the order of 4 to 5 percent can be expected. Further, the pattern of amortization of these charges coupled with higher taxes in the year of sale due to elimination of the recapture of depreciation credit,

Estimates indicate that properties formerly turned-over after about ten years due to tax shelters may be held for 3 or 4 years longer because of the modification in TRA. However, no increase in rental housing quality can be expected because of this change. Other market effect of TRA include a small windfall gain to owners of existing rental properties who will not be as affected by these new provisions which pertain mostly to newly constructed units. Hence rent increases necessary to provide suppliers of new construction with a competitive return will be capitalized into higher values for existing properties. However provisions in TRA do tend to reduce somewhat deadweight losses enjoyed by investors in tax brackets that are higher than the tax bracket considered applicable to the marginal real estate investor. Subsidized rental housing programs would seem to be affected almost as much as unsubsidized housing, with the exception that the phase-in schedule for construction interest and property taxes does not affect new subsidized properties until two years after the schedule for unsubsidized property becomes effective. Further, the depreciation recapture credit is not eliminated for unsubsidized properties but deferred further into the future. These two exceptions will slightly moderate increases in rent expected on subsidized properties.

Other potential tax reforms included in this study were limitiation of artificial accounting losses, full recapture of depreciation, restriction of depreciation methods to either straight line over 40 and 75 years or reverse sum of the years digits over 40 and 75 years. Each of these provisions was considered individually in the base case and then all were coupled with full recapture depreciation and the impact on rents were assessed. Results indicate that rents can be expected to increase in amounts ranging from 9 percent to 30 percent depending on the severity of the tax change chosen and assumptions

concerning changes in tax rates relevant for the new marginal investor in each case. Other estimates indicate uniformly longer investment holding periods irrespective of the tax change or tax rates considered. These longer periods result from the elimination of tax shelters and the "flattening" of the yield pattern on real estate investments.

The paper concludes with consideration of other market effects from the more sweeping tax reforms. The obvious benefit from such reforms are that the advantage enjoyed by higher tax bracket investors over marginal investors due to tax shelters would be virtually eliminated by tax reform. However these benefits would come at the expense of much higher shelter costs for renters and unless corresponding reductions in tax shelters for homeowners occurred, these "reforms" would clearly work to the disadvantage of renters. Additional considerations in the paper deal with the question of potentially longer economic lives for rental property and the effects on the physical size of rental units. Based on analysis presented here, no substantial increase in the economic life of rental properties seem warranted by the tax reform changes considered, however the physical size of rental units would probably become smaller in the future, particularly if no reforms are complemented for homeowners. These and many other issues require more in-depth analysis, however, before any firm conclusions are drawn.

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